April, 1960

MANAGEMENT *and* BUSINESS AUTOMATION

The Big Count

Page 16

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The new language that money talks

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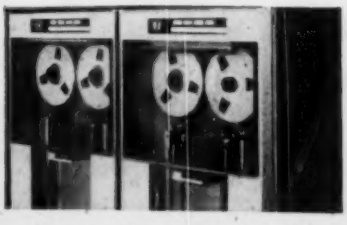
Your local IBM Sales Representative will explain how you can save by using tested and *retested* IBM Magnetic Tapes ... and how, in many other ways, IBM helps you to enjoy Balanced Data Processing.



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WON'T PUSH OUT!

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Each wire tip is precision-made to insure against accidental dislodging from your control panel.

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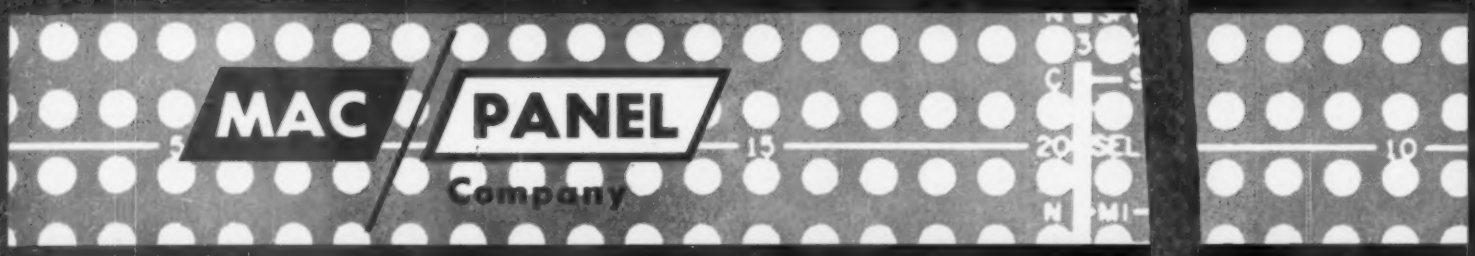

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MANAGEMENT *and* BUSINESS AUTOMATION

April, 1960
Vol. 3, No. 4

New ideas, developments, applications, results, and the human impact of business automation in commerce, industry and government.

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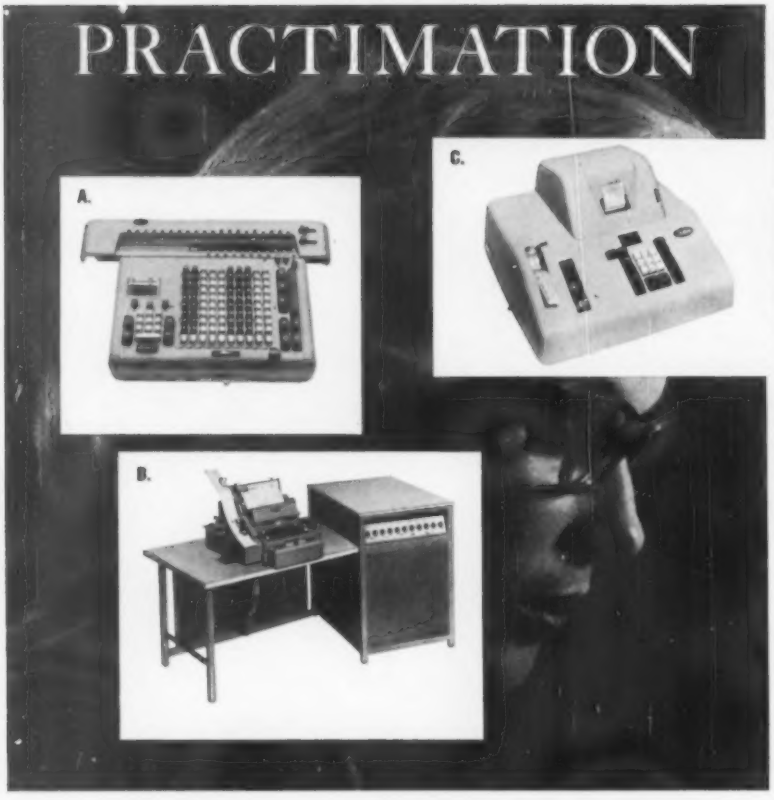

A new word, which means more than automation, for it is the custom-fitted application of today's finest automation equipment to your particular needs...

This announcement is a culmination of Friden's years in integrated data processing. Friden's assumption of responsibility for the most important phase of automation—its practical application.

The first step to PractiMation is a critical analysis of your office. Second, an outline of objectives for increasing its efficiency (without personnel changes). Then, consult your Friden man. He is an expert, and has solved a good many problems like yours. His help can be invaluable.

Next, you need equipment that can be used by your present employees without special training; equipment which is sanely priced, easy to install. And, above all, equipment which is expansible with your business.

Here are some good examples:

A. Friden SBT Calculator—the famous "Thinking Machine of American Business." Touch-one-key simplicity. Performs more steps in figure-work without operator decisions than any other calculating machine ever developed.

B. Friden COMPUTYPER® (Model CTS)—produces a complete invoice in one operation with virtually no operator intervention. Reads alpha-numeric data from tape, edge-punched cards, or tab cards; accepts variable data through typewriter keyboard. Machine also punches selected data in tape or cards for statistical reports. The Computyper and any good typist make up an entire billing department.

C. Friden ADD-PUNCH® (Model APT)—A Data Processing machine, the APT produces a printed tape, and a punched tape for subsequent processing.

These are just three. Friden's full line of adding machines, calculators, accounting machines, mail room equipment, and "Tape Talk" IDP equipment can fully automate your office. Call your Friden man today, or write directly to Friden, Inc.

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For More Information Circle Reader Service Card No. 4-53

Scanning the Issue

Uncle Sam is out to get the facts again, with the result that business, labor, and government will soon be receiving a veritable treasure house of social and economic statistics that will guide their operations for the next ten years. The 1960 Census reports will be produced some $15 million cheaper and six to 18 months sooner than the 1950 reports, thanks to electronics. Some 4,000 tons of printed material—which required seven acres of storage space—is being used to gather census data. Microfilming will reduce this mass to rolls of film. Once again, **The Big Count Is Under Way,** page 16. . . . The Veterans Administration's Department of Insurance is second only to the Metropolitan Life Insurance Co. in world size. With some six million accounts, the VA recognized the need for a fast and efficient method of locating and copying historical data requested by its millions of customers. For the answer, read **A Custom-built System for VA Records Retrieval,** page 26. . . . Our associate editor journeyed to Detroit for a first-hand glimpse of automation in action at GM Photographic, which services seven of the General Motors Corp.'s division. His picture-word story on how **Cards and Camera Speed Catalog Production,** page 35, should prove of helpful interest to those companies with problems in the printing of parts and price lists. . . . **New Billing Method Moves Tomorrow's Orders Today,** page 22, reveals how an electronic component distributor solved a costly delay in invoice preparation. . . . Three new and important entries to the business computer field are previewed this month, an indication of the growing competition for data processing dollars.

HORIZONTAL and VERTICAL

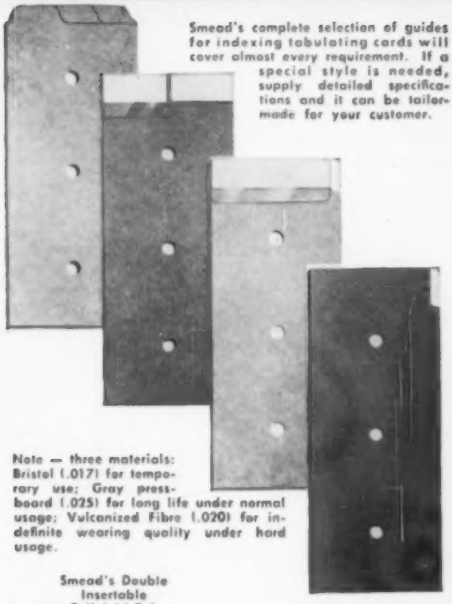
TABULATING CARD GUIDES

by Smead

also POCKETS—FOLDERS—BINDERS

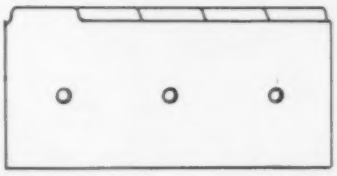
USED IN ALL TYPES OF AUTOMATED SYSTEMS

A COMPLETE LINE OF HIGHEST QUALITY INDEX GUIDES

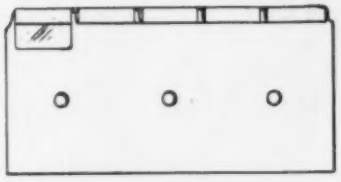


Smead's complete selection of guides for indexing tabulating cards will cover almost every requirement. If a special style is needed, supply detailed specifications and it can be tailor-made for your customer.

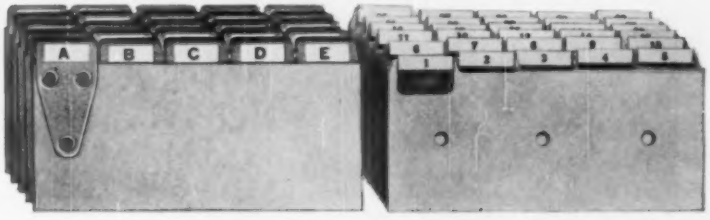
Note — three materials: Bristol (.017) for temporary use; Gray pressboard (.025) for long life under normal usage; Vulcanized Fibre (.020) for indefinite wearing quality under hard usage.



Available in plain tab, third-cut and fifth cut, 7⅜" wide, 3⅝" high, ⅜" tab exposure.



Double insertable celluloid tabs, third cut and fifth cut, 7⅜" wide, 3⅝" high, ⅜" tab exposure. Pressboard stock. White inserts included.



TA-151-25—25 division A to Z, flat metal tabs, 7⅜" wide, 3⅞" high. Pressboard stock. Available in larger divisions.

TA-154-31—Daily 1 to 31 flat angled insertable celluloid tabs, 7⅜" wide, 3⅝" high, ⅜" tab exposure. Pressboard stock.

Smead's Double Insertable Celluloid Tab
Flat-angled Insertable Celluloid Tab
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Pin Feed Inserts and Labels
Folders for Filing of Edge Punched Cards and interpreted copy
Wallets with Acetate Windows

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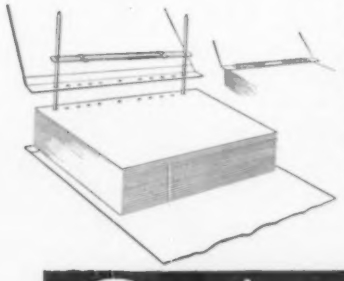
Provides clear vision and protection of card. All Acetate (10 Point). Overall size 7⅜" x 3⅝".



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Please send me complete information on your new electronic computer, the DE-60.

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Company Position

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City Zone State

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RANDOM ACCESS

Information bits from the Editor's memory file

Housing the Nation's Paperwork

One man's paper is another man's profit! The other man in this case is Emmett J. Leahy, who recently opened the Leahy Archives of Chicago. The building will eventually be the largest single center for housing and servicing records for business and institutions in the world. Mr. Leahy, a former government archivist and one of the nation's top authorities on records management, says that it costs the average company between $225 and $250 each year to maintain a four-drawer file. In his archives, the entire contents of the same file can be stored for about 24 years for $200.

The records are stored in cardboard cartons on erector steel shelves. Contents are cataloged on visible record files with a simple coding system, providing rapid access to the record location. Workers, equipped with plug-in phones, move through the vault-like building withdrawing records for customer reference within minutes after the information is requested by the client. Data can be relayed by phone, photocopied, or the original dispatched to the client's office. According to Leahy, data processing is grinding out more than 175 billion pieces of paper annually—the rough equivalent of a complete file drawer of paper for each of the nation's 62 million workers.

Program for Garbage

Los Angeles sanitation officials turned to the computer for an answer to the problem of where to dump the city's rubbish. The problem: The city has 258 collection trucks each of which would travel a different distance to a rubbish dump site. There are 14,400 possible collection routes and disposal site combinations.

Programmers will feed such data as hourly salary of truck drivers, cost per mile of operating a truck, size of disposal site and route variations. The computer will provide a cost figure for each site.

The Cost of Copies

American business management will spend some $200 million this year for copying machines and related supplies, according to industry estimates. The never ending demand for "copies of almost everything" at all company levels indicates that the industry will top $400 million by 1965. One reason for the continued growth: at today's wage rates it costs about 60 cents to type a page, whereas average copy can be made for under 10 cents.

Computers at the Bar

Lawyers now spend 75 percent of their time hunting through hundreds of law books seeking pertinent cases, says Vincent P. Biunno, an expert of legal research for the American Bar Association. He proposes that a computer be used to group like cases together, enabling lawyers to determine whether the client has a chance to win the case. Such a system would also help the judge to make better decisions, as it would bring to light some obscure cases that might be missed in manual research.

MESSAGE TO AN IMPATIENT MAN

NO TIME LAG

WITH THE PHILCO 2000 COMPUTER

The Philco 2000 Electronic Data Processing System is the world's fastest because it is the only asynchronous system commercially available today! Each operation starts the instant the previous operation is completed, without waiting for a pre-set clock pulse. Asynchronous operation eliminates the time lag that occurs in all clock-timed systems. It processes more work in any period, saves costly waste of time. The Philco 2000 is the pioneer in all-transistor logic and circuitry. It is the computer that changed the industry.

PHILCO 2000
DATA PROCESSING SYSTEM

PHILCO®

Famous for Quality the World Over

Will not become obsolete

Because the Philco 2000 is truly asynchronous, newly developed components and design improvements may be incorporated at any time, without redesign of equipment and with no reprogramming. The system can always be updated, at minimum cost.

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Complete customer service

Philco provides every important service, including: automatic programming, programming library, on-site maintenance and training tailored to your needs.

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WRITE today for your copy of this new brochure on the Philco 2000 computer . . . the *first* fully-transistorized large scale data processing system and the *only* asynchronous general purpose system available.

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for more information

. . . about new products, or items advertised in this issue, use the convenient reader's service card opposite page 42.

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This is an added free service for readers of

MANAGEMENT
and
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from the Publisher's Desk

A SURE SIGN of a growing profession is the growth in the number of associations it can support. As the national associations expand, the usual trend is for more local and regional groups to come into being. In due time, there is association activity all the way from Yakima to Fort Lauderdale.

The primary motives of most professional associations are to educate the membership and to raise the standards of the profession. These are laudable purposes and deserve the support of all who stand to benefit by their attainment.

Another activity which rates high in importance is the exhibit. An old yarn says that when two American businessmen get together, they immediately form a committee; and if joined by a third, they form an association. We suspect that when they add a fourth, it's not for bridge but for the purpose of holding an exhibit.

We have nothing against exhibits as such. When properly managed and when regulated as to frequency, they can prove very educational for association members and be financially sound investments for the manufacturers involved.

Unfortunately, too many associations, particularly at the local and regional levels, feel impelled to use the exhibit to finance their expanding ambitions. The squeeze is placed on suppliers to take space with little regard to whether or not an influential audience is provided to view the exhibits. This pressure has led a number of leading equipment manufacturers to curtail their participation and to form their own show organization, Office Equipment Manufacturer's Exhibits, Inc.

This is excellent proof of the adage that you can go to the trough too often. We hope that those involved with business automation and data processing associations will heed this lesson and put the brakes on the increasing number of exhibits.

Professional associations should be concerned mainly with their own business problems. Running exhibitions is a business in itself . . . and is better left to specialists. When it seems feasible to have an exhibit in connection with a business program, outside talent should be hired to manage the show.

We think that MBA readers involved with association work will further their own interests by keeping these facts in mind.

Charles W. Gilbert

MANAGEMENT
and
BUSINESS AUTOMATION

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Charles W. Gilbert

Manager, Marketing Services,
Stanley Roy

Production Manager,
Mary Haley

Treasurer,
Richard M. Daugherty

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System is surprisingly simple: you type data to be published on "EAM" cards, which are easy to keep up-to-date. Then you photograph the cards with a Listomatic Camera . . . and process the film in a Listomatic Film Processor. Your printing plates are made directly from the negatives.

Mail coupon today for free folder on the Recordak Listomatic Camera and the many savings it makes possible.

RECORDAK®

(Subsidiary of Eastman Kodak Company)

originator of modern microfilming

—now in its 32nd year

IN CANADA: contact Recordak of Canada, Ltd., Toronto

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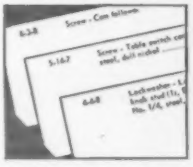
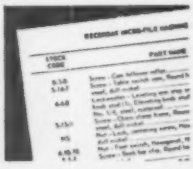


1. Information is typed on Electronic-Accounting-Machine cards. They make a compact, permanent data file. Corrections are easy as new cards can be slipped in up to last minute.

2. Feeding cards into the camera (230 per minute) makes negative like this. Camera, through system of ingenious controls, adjusts automatically to photograph 1, 2, or 3 lines on each card.



3. Finished printing plates are made directly from negative paste-ups. Plates are adaptable to any kind of printing method—*require no proofreading*. Results are sharp and clear.

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RECORDAK CORPORATION SS-4
415 Madison Ave., New York 17, N. Y.

☐ Send folder describing Recordak Listomatic Camera;
☐ Have a Recordak representative contact me.

Name_____ Position_____

Company_____

Street_____

City_____ State_____

For More Information Circle Reader Service Card No. 4-59

Letters

Dear Sir:

Since there is some very helpful collaboration and quite friendly competition between the various company's systems men in the Pittsburgh chapters of the International Systems and Procedures Association, I was especially interested in the Kopper's story on page 38 of your January issue of MBA.

I cannot resist the temptation, however, to note that Allegheny Ludlum Steel Corporation, also a progressive Pittsburgh company, has exactly the same installation on an Accounts Payable procedure, installed in 1959; more to the point, and contrary to the timing implication in the third paragraph, we were using an NCR Class 31 unit intercoupled to an IBM 024 Keypunch through a Systematics Intercoupler on a very successful maintenance job cost control installation (the first in the nation of this type) in early 1957, several months before Koppers started their program.

Don Barkely
Supervisor,
Systems and Procedures
Allegheny Ludlum
Steel Corporation
Pittsburgh, Pa.

Dear Sir:

Your Editorial in Jan. 1960 issue on "character recognition" and "standardized business forms" attracted my attention.

I am enclosing (immodestly) a reprint on an article published in 1957 by the Systems and Procedures Quarterly: SPA's magazine.

As you may know, SPA is now actively supporting this kind of program under the leadership of Norman Ream, regional vice president (SPA) and systems planning director of Lockheed Aircraft Corp., Burbank, Calif.

Rudolf Borchardt
General Supervisor IDP
Marketing Research
Western Union Telegraph Co.
New York City

Dear Sir:

I have received and read with great interest the January and February issues of MANAGEMENT AND BUSINESS AUTOMATION. Much of the material contained therein will be valuable source material for historians of technology in the future.

Melvin Kranzberg
Editor-in-Chief
Technology and Culture
Case Institute of Technology
Cleveland, Ohio

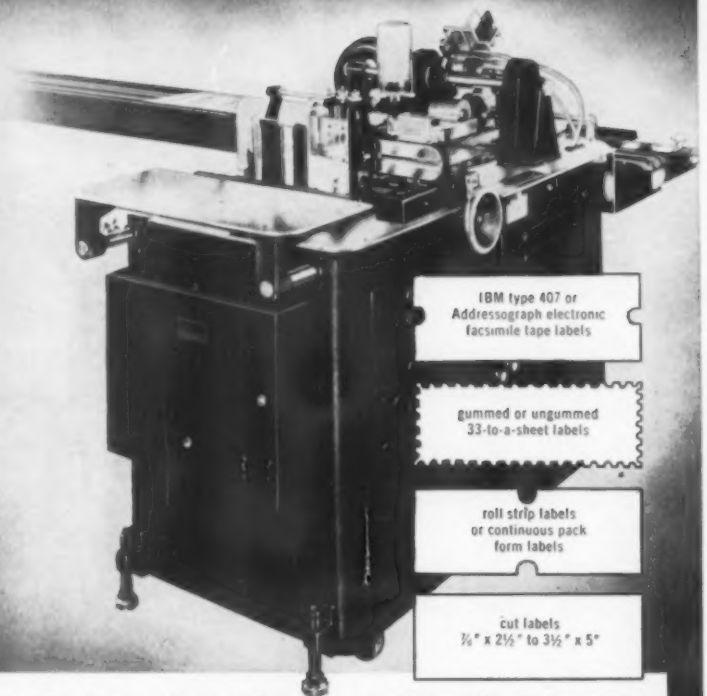
Dear Sir:

In the January issue of your magazine there is an article titled "SKF Tightens Control over Production Paperwork."

Would it be possible to send me two or three copies of this article, since I would like to post them on the bulletin board in my department.

James R. Miller, Manager
Production & Inventory Control
SKF Industries, Inc.
Philadelphia, Pa.

NOW! PRINTED PIECES
LABELED AUTOMATICALLY



Applies labels addressed from your punched cards, plates, stencils and other addressing systems. *Even applies cut or individual labels!* Trims costs by applying in excess of 14,000 labels per hour. Handles post cards, insertion cards, pamphlets, brochures . . . all sizes of envelopes . . . and lightweight booklets, magazines, catalogs and quarter-fold tabloids. Compact, too! And so simple that it can be operated by your own personnel.

The Cheshire Model E.

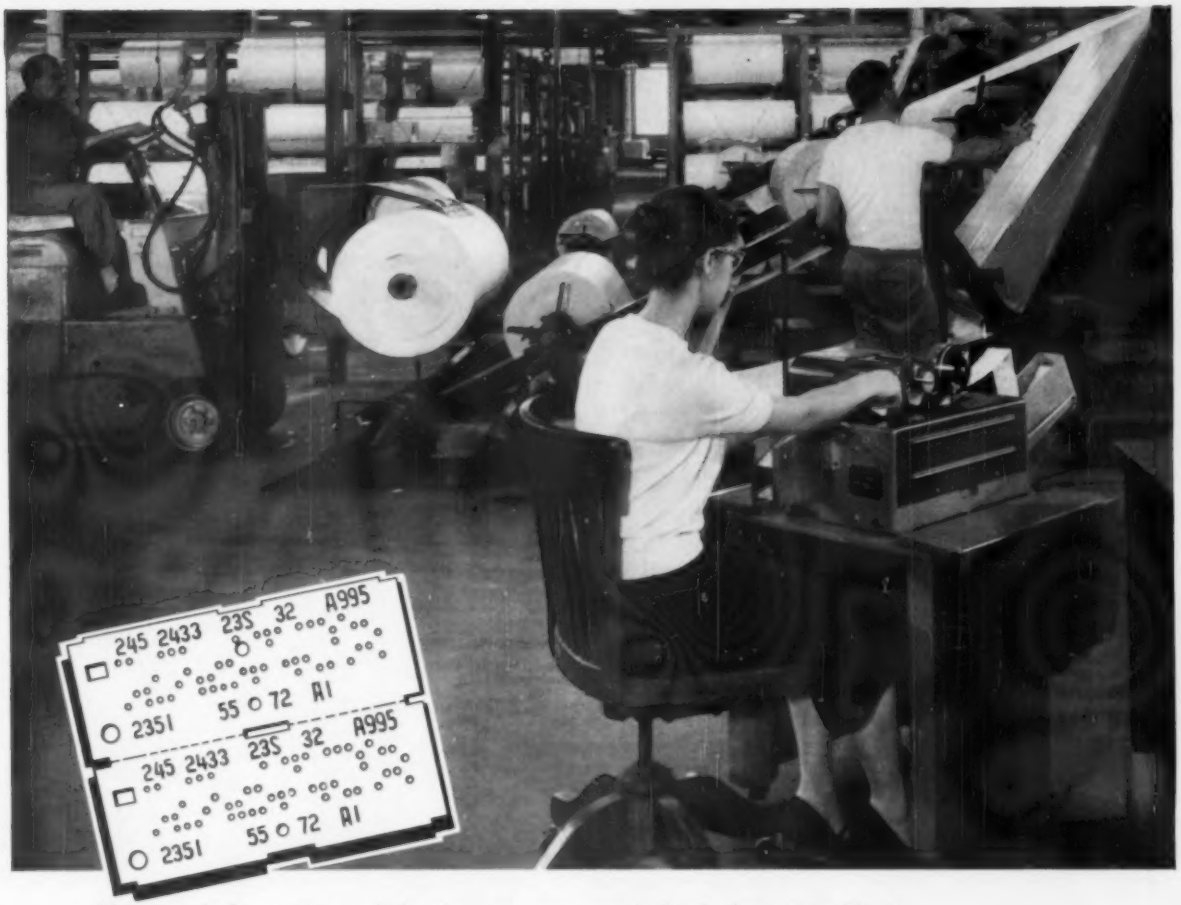
Write for descriptive brochure

CHESHIRE INCORPORATED

Dept. MB-4
1644 N. Honore St. Chicago 22, Ill.

For More Information Circle Reader Service Card No. 4-60

ADD TO THE ACCURACY OF YOUR DATA PROCESSING!



Now, as information originates, you can create basic input media to accompany your product through manufacturing, inventory and shipping.

You reduce human error when you create basic input media at the point where data starts! A single Dennison Print-Punch setting produces a machine language history of an entire series of operations on a durable flexible ticket . . . virtually eliminates errors due to manual recording, selection and key punching of data.

Low-cost Dennison Print-Punch Machines are simple to operate! They can be operated by anybody and located where you need them . . . from Receiving to Shipping and anywhere in between. Available models simultaneously print and punch 20 column, 25 column or 31 column tickets at a speed of over 300 stubs per minute.

Dennison Print-Punch Tickets are versatile, too! These miniature partners of your present punch cards can travel places and stand abuses that handicap larger input media. Available in continuous strips of single and multi-stub tickets — serially or repetitively numbered — they can be tailored to fit just about any control or accounting system.

Compatible with most data processing equipment! Dennison Print-Punch data can be automatically converted to punched cards or tapes.

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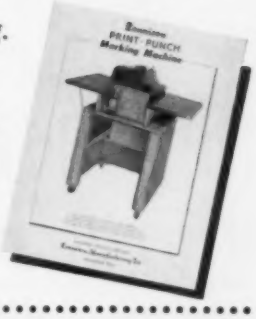

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ANNOUNCING

FACT

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FACT (fully automatic compiling technique) is a complete automatic programming system for the highly advanced Honeywell 800 transistorized data processing system. It is designed to simplify the preparation of business data processing programs by providing a convenient problem-oriented language, a highly favorable source-statement-to-machine-instructions ratio, adaptability to a wide range of equipment configurations, and more data processing functions than ever before available in a compiler.

FACT LANGUAGE SHORTENS THE GAP BETWEEN MAN AND MACHINE

FACT lexicon is made up of familiar words of everyday business usage such as FILE, ENTRY, PROCEDURE, REPORT, DELETE AND UPDATE. Source programs are initiated by combining lexicon words with the names of data units (files, entries, fields) to form ordinary English sentences and paragraphs. FACT accepts programs stated in this language and automatically creates the detailed machine language programs required to direct the data processing system in its work.

FACT also provides complete printed information about its own operation, including program listings, memory assignments and diagnostic data pertaining to source statement errors encountered during compilation. All of these outputs and aids are expressed in language easily understood by the programmer.

FACT WORKS WITH SMALL AS WELL AS LARGE SYSTEM CONFIGURATIONS

FACT can compile programs using as few as four magnetic tape units and 4096 words of memory. It can take advantage of any additional equipment that may be available and programs can be compiled on one Honeywell 800 for execution on any other Honeywell 800 system.

The programmer uses environment statements to describe the equipment array available for compilation as well as the array on which the object program is to run. Each object program is compiled to operate as efficiently as possible with the allotted machine units.

WITH FACT, FEWER PEOPLE WRITE MORE PROGRAMS IN LESS TIME

FACT may be used to prepare many different types of programs at many different levels of complexity including: input card reading and editing, creation of data files, data sorting, arithmetic computations, updating of data files, and generation of printed or punched reports based on input data, file data or program results.

The resulting compression of programming time and effort means that a given amount of work can be done with a smaller staff, jobs can be placed on the data processing system faster, programs can be modified more easily to meet changing requirements, and the data processor can be used profitably on a wider range of jobs.

HONEYWELL 800 CUSTOMERS ARE WRITING PROGRAMS IN FACT LANGUAGE RIGHT NOW

Honeywell Service as well as Honeywell EDP equipment is setting the pace for the industry as evidenced by the fact that customers for Honeywell 800 systems are even now writing programs in FACT language. Experts in the field of automatic programming, including compiler creators as well as users, have quickly recognized the outstanding characteristics of the Honeywell business compiler. If you would like to make your own comparison of FACT features with those of any other compiler, write for a copy of the new 94-page manual, "FACT — a new business language." Address your request to: Minneapolis-Honeywell, Datamatic Division, Wellesley Hills 81, Massachusetts, or Honeywell Controls Limited, Toronto 17, Ontario.

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Honeywell

H HONEYWELL *Electronic Data Processing*

For More Information Circle Reader Service Card No. 4-63

THE BIG COUNT IS UNDER WAY

Electronics has the key role as the Bureau of Census begins preparation of the 1960 Census reports—biggest data processing job in its history.

By Arnold E. Keller

LIKE a giant statistical tapestry woven from billions of facts and figures, the 1960 U. S. Census report will begin to take form this month at the Bureau of Census headquarters in Suitland, Md.

Blending the speed and accuracy of advanced electronic systems with the latest in scientific sampling procedures, the Bureau will produce a report involving the largest compilation of social and economic data in the nation's history. An army of some 160,000 enumerators, more commonly known as Census takers, is now busy gathering the initial data. They will visit about 60 million urban and rural dwelling units to count an estimated 180 million persons. In addition to recording the social and economic facts of the population, the workers will list the characteristics of the individual dwellings.

The task of assembling, tabulating and publishing the Census results is probably the biggest single data processing job ever attempted. The sheer mass of numbers would render the compilation an impossible task were it not for the invention and development of remarkable electronic devices, many of which have been pioneered by the Bureau's own research staff. One of their more ingenious creations—FOSDIC—is the chief reason why this Census will be the first in which results will be obtained almost exclusively through electronic data processing. FOSDIC (an alphabetic shortcut for Film Optical Sensing Device for Input to Computers) will convert microfilmed data to a series of electronic dots on magnetic tape, speeding the preparation of input for the Univac 1105 computers, product of Remington Rand Univac Division of Sperry Rand Corp.

The first step in gathering Census data was

Dr. Robert W. Burgess (standing), Census Bureau Director, watches as FOSDIC (Film Optical Sensing Device for Input to Computers) transfers Census data from microfilm to magnetic tape. FOSDIC was developed by bureau's research staff. Five machines will be used to handle the job.

taken last month with the mailing of an Advanced Census Report form to every household in the United States. Householders were asked to answer seven questions about every person in the house and four questions about the dwelling itself. They were further requested to have this information on the form in advance of the worker's visit.

On April 1, the army of enumerators set out to visit every home in the country. In covering 3.5 million square miles of land area in the 50 states, they will travel approximately 25 million miles; an estimated combined distance equal to 1,000 times around the world.

For Census purposes, the United States is divided into 250,000 enumeration districts. About two-thirds of these are in urban areas. Within these sections, the enumeration district may vary in size from a single large apartment building to a scattering of separate dwellings over an area of 50 blocks. In rural sections, the districts will range in size from a few square miles to over 2,000 square miles.

About 250,000 basic maps have been prepared defining the limits of each district. The maps are enlarged sections of some 20,000 county, township, city and town maps. As they make their rounds, enumerators are charged with the responsibility of bringing these maps up to date, marking in locations of new structures, roads and other changes.

Work sheets for the enumerators have been designed with FOSDIC in mind. The sheets are 14 by 16 inches, bound in loose-leaf books with a spiral hinge. Answers to most questions are indicated by blacked-in circles under the questions. These areas, or grids, are bounded by small black squares, recognizable to FOSDIC after the sheets

have been microfilmed. The enumerators transcribe the information supplied by the householders in the Advance Census Report to these sheets.

At every fourth house visited, the enumerator leaves a Census Household Questionnaire. On this form, the householder will be asked to report more detailed information about members of the household and about the dwelling unit. The recipient of the form gets a postage free envelope and instructions to mail the questionnaire to the local Census office within three days. This information will then be transcribed to the work sheets by workers.

Under Census law, all persons 18 years old and over are required to answer official Census questions about themselves and members of their household.

Mechanical processing of the huge mass of data will begin late this month at the Bureau's Census Operations Office in Jeffersonville, Ind. The worksheets used by the Census takers are forwarded there for microfilming from all over the United States and its overseas populated areas, including the Commonwealth of Puerto Rico and island possessions. All told, some 600,000 spiral bound books will be processed by the Jeffersonville office.

On arrival, the books are grouped into work units of 25 books each. A trained staff of microfilm technicians photograph the work sheets. The open book is photographed, two pages simultaneously with a reduction of 28 diameters, on 16 mm film. Each sheet occupies approximately one square inch on the film, and each work unit results in a 100-foot reel of film. The entire operation—using up to 50 cameras on a "round-the-clock" shift—will produce 50,000 rolls or about 950 miles of microfilm.

The developed microfilm is then shipped to the Census Bureau's main offices at Suitland. Here the film is processed through the FOSDIC machines which converts the data to a series of electronic dots on magnetic tape. FOSDIC scans the film frames and locates the enumerators' entries which are in the form of blacked-in circles. The electrical impulses, activated through photo-electric cells, are conveyed to the magnetic tape. FOSDIC is sensitive to the difference between an intentional mark and an erasure. In the case of duplicate markings in the same grid area, it picks the denser of the two.

Five FOSDIC machines are being used for the 1960 Census. They are capable of performing a job roughly equivalent to the efforts of 2,000 key punch operators, as well as eliminating the handling of millions of punched cards.

Once this information is in magnetic tape form, the Bureau's two Univac 1105 computer systems take over the processing operation. During peak-load periods, which start early this summer, the Bureau will use two additional 1105s, one of which

Technicians, working around-the-clock at Census Operation office in Jeffersonville, Ind., will microfilm reports on a battery of Recordak MRC-4 cameras, reducing each worksheet to one square inch of film. Operation eliminates keypunching of census records.

Robert Drury, Chief of the Bureau's electronics division, checks schedule with operator at the console of Univac 1105 computer.

is installed at the Illinois Institute of Technology in Chicago and the other at the University of North Carolina at Chapel Hill.

A corps of computer program specialists has prepared instructions to be given the 1105's for tallying the Census data in accordance with predetermined statistical needs and publication schedules. These program instructions, for example, direct the computer by means of coded numerical orders on tape, to tabulate the number and racial characteristics of all males in a given enumeration district in a city or in a county. The computer may next be instructed to furnish the same information for all females.

Some seats will change

The computers mechanically edit for missing or inconsistent items on the worksheets and prepare a diary record of the adjustments for review by the Census Bureau professional staff. The magnetic tapes will be used over and over again until the billions of facts about the population and dwellings of America are recorded in summary tapes, carrying only the information required for specific reports.

The Univac system's high-speed printers can convert the taped information into printed reports at the rate of 600 lines per minute. Pre-printed forms are used in these printers when tables are produced. The reports go to the Government Printing Office for publication, and final copies are expected to total some 100,000 pages.

Preliminary population totals, based on field counts, will be made for counties and places of 10,000 or more inhabitants. These will be released this month and in May. Final State totals will be supplied to the President in November. He will, in turn, transmit these to Congress along with a table apportioning seats among the States in the House of Representatives as provided for in the Constitution. The final bulletins containing official population counts for each State and all its geographic subdivisions will be available the latter part of this year and in early 1961. Publication of the many special and detailed reports will follow shortly thereafter.

Due to the advanced automation techniques, the publication of all Census reports will be completed from six to 18 months sooner than in 1950, and at an estimated savings of $15 million over the previous decennial reports.

Birth of an empire

While this is the first time that EDP has taken over the complete compilation job, it is by no means the Census Bureau's introduction to business automation. Actually, the Bureau, under the direction of Herman Hollerith, pioneered the use of automatic data processing.

Hollerith came onto the scene in 1889, just shortly after the Census office had completed final reports on the 1880 count. He realized that the existing methods would mean that compilation of the 1890 reports could well overlap the 1900 Census taking.

As a solution he developed the punched card and

Continued on page 40

NEXT MONTH . . .

Facsimile . . .

is assuming an ever-increasing role in business and government communications systems. An MBA round-up brings you up-to-date on this accurate and inexpensive method of data transmission.

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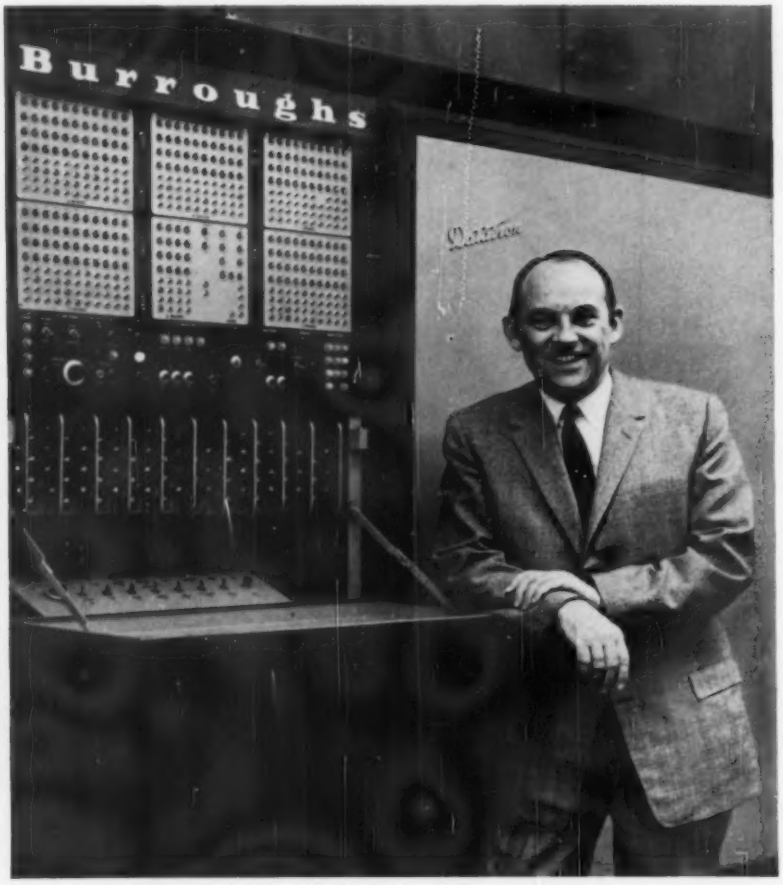
***SPAN* . . .**

an idea born at the top management level, is the first computer co-op. Now in its third year, the co-op has been termed a "complete success" by participating insurance companies.

A statement from Behr-Manning Co.: "*Our Burroughs computer processes our customer order data in 1/50 the time*"



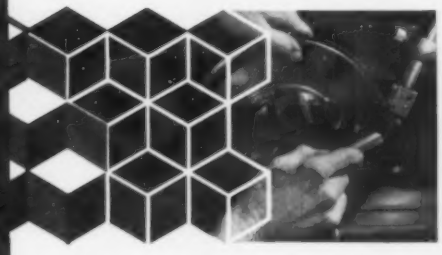
Behr-Manning's Philip Doherty (left) meets with members of his group at the Datafile.

Edwin C. Evans, Vice President and General Manager of Behr-Manning Co.

"Our Burroughs computer processes our customer order data in 1/50 the time... and provides our management with up-to-the-minute statistical reports for the control and planning of our business."

EDWIN C. EVANS

Vice President and General Manager
Behr-Manning Co.



Nearly 40,000 different products are manufactured by Behr-Manning Co., of Troy, New York, a division of Norton Company. These products have use in almost every manufacturing process... from the making of cars to the shelling of peanuts. The products are of three main types: coated abrasives, pressure sensitive tapes and floor maintenance products. Behr-Manning, with its parent company, the Norton Company, is the largest abrasives enterprise in the world, and Behr-Manning's cellophane and other pressure sensitive tapes, sold under the "Bear" Brand are quality leaders in their field.

Behr-Manning's vast selection of products are stocked and shipped from the factory warehouse and from 16 branch warehouses across the country. Their products are purchased by countless different types of customers through every major channel of distribution.

The company, which began as a sandpaper business in 1872, now has 3,000 employees. As Behr-Manning's line of products and list of customers grew, their record keeping and accounting procedures also became extremely complex. In November, 1958, they installed a Burroughs 205 electronic data processing system to solve their paperwork problems.

Behr-Manning's decision to purchase a Burroughs 205 was preceded by considerable investigation. Vice President and General Manager, Edwin C. Evans, states, "We first organized a 6-man study team. The group's job was to determine whether or not a data processing program would help us, and if so, to recommend which data processing system would help us most. When we decided to enter electronic data processing, the group prepared a detailed description of our particular requirements. We settled on Burroughs equipment because the 205 best satisfied our specific needs. Furthermore, the high capacity, low-cost random access Datafiles were especially suited to our application."

The computer soon took over a number of complex clerical functions... in actuality, 19 different computational assignments, from factory payroll to budget reporting. The computer's capacity enabled it to do all of this work in only 10 hours per week.

Despite the magnitude of these jobs, this was not the chief reason for acquiring the 205. Behr-Manning's most important need is a process called "order entry," which literally automates the entire sales-inventory-billing-report cycle.

The source of all Behr-Manning operations is the customer order, which is also a source of a mass of paper work. It must be edited, analyzed and reproduced prior to completion of processing.

"All order entry, from every branch, can be done by our 205," states Philip Doherty, Behr-Manning's Manager of Operations Analysis and Planning. "We process thousands of orders a day. An original order is picked up just once at a receiving location and all the work is done automatically in the system. An order coming in from a branch office is transmitted in minutes to headquarters by private wire, quantity and item data are automatically fed to the computer, and return wire messages make stock status and shipping information instantly available to the branch office."

In addition to processing the order, the 205's magnetic tape Datafiles, each having a capacity of 20,000,000 digits of information, hold many thousands of different customer and product records. When an order is entered in the 205, the computer locates the appropriate customer and product records, then issues either a production order or shipping instruction. It also automatically prices the order and issues the invoice. Upon completion of a customer order, the computer automatically issues factory orders to replenish the stock level of the factory or branch warehouse.

The statistics accumulated by the 205 are then prepared in numerous different reports which are distributed either daily, weekly, monthly or quarterly in a digested form for Behr-Manning management. The reports include information on sales, finance and production. Previous to the 205 these statistical analyses required as long as three weeks to prepare. Now, even the most involved report can be issued in 48 hours, and if information is needed more quickly, it can be obtained by inquiring through the computer console. In such cases, specific replies are typed automatically by the printer.

"These up-to-the-minute reports," says Behr-Manning's President, Elmer C. Schacht, "are invaluable to us in the planning and control of our business. The information obtained from one waste report alone should save us thousands of dollars a year. In addition to improving the speed and accuracy of our own operation, installation of the 205 benefits our customers with the fastest possible service."

Behr-Manning originally leased their 205 computer, but after about nine months of use, they decided to purchase it. Vice President Edwin C. Evans points out, "By June, 1959, it was obvious that our 205 would accommodate all of our 'order entry' procedures plus many of our other data processing needs. So at that time we purchased the 205 outright. The equipment had proved itself and it made economical good sense to own it rather than rent it."

Like the people of Behr-Manning, hundreds of other industrial and business users are confirming the same experience. Burroughs complete line of electronic data processing equipment is backed by a coast-to-coast team of computer specialists, all eager to tell you how Burroughs can help in your business. For additional information, write General Manager, Data Processing Systems Group, Detroit, Michigan.

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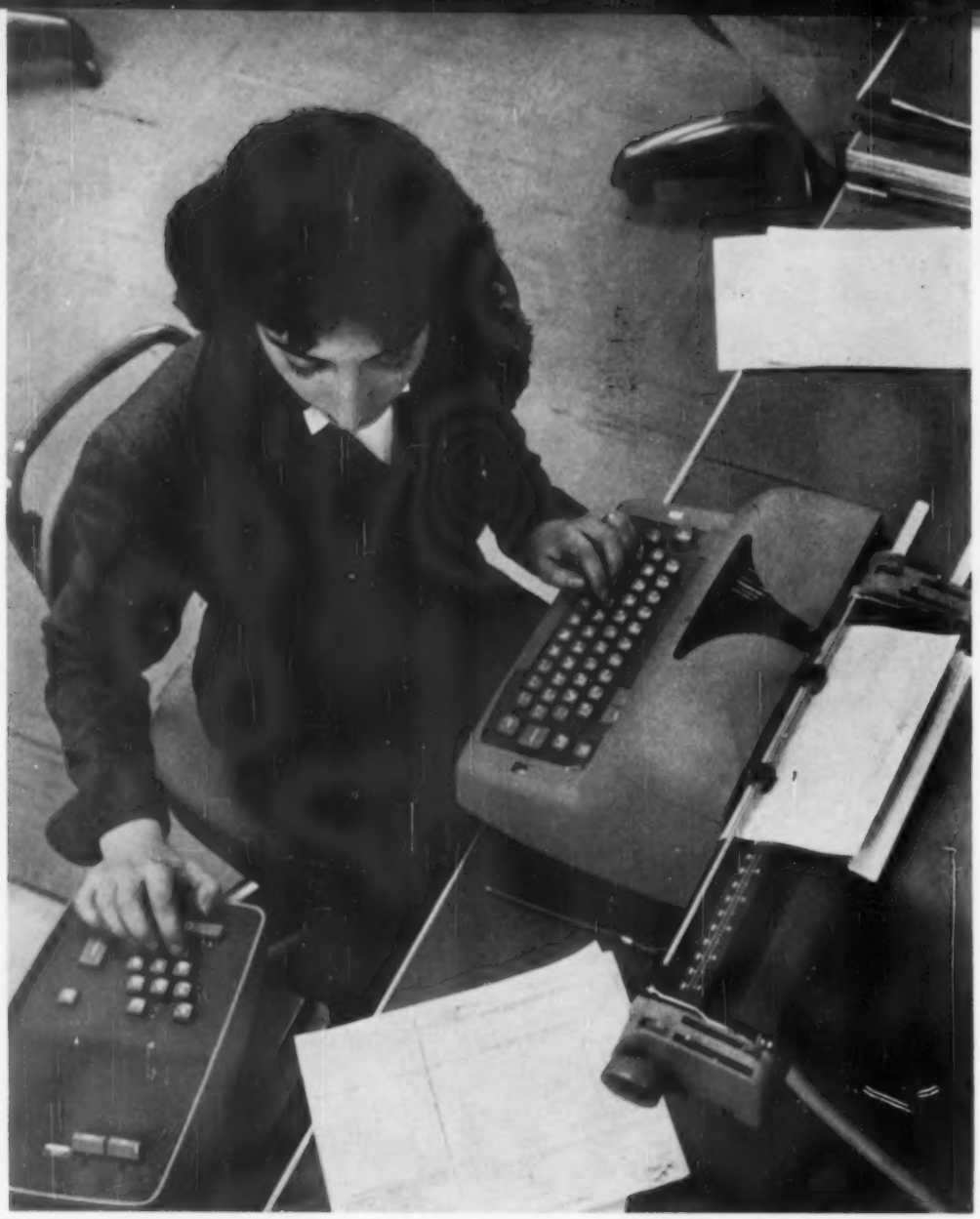

Billing at Schweber Electronics is swiftly handled on the new IBM Electronic Typing Calculator. The system consists of an electric typewriter and small companion keyboard, both cable-connected to a compact computing unit.

New Billing Method Moves Tomorrow's Orders Today

WHEN orders placed today are "needed yesterday," a customer-minded distributor must be prepared to move merchandise fast. This is particularly true in the electronic components field which serves military and commercial aircraft companies, missile makers and computer markets.

If orders, otherwise ready for shipment, remain overnight, awaiting production of proper shipping and invoice records, both sales and customers may be lost. This is why fast-growing Schweber Electronics in Mineola, N. Y., sought and found a better system to handle its daily billing load.

With the installation of a processing system built around the use of an electronic typing calculator, customer billing productivity has been increased 25 percent. The equipment automatically extends and totals all item quantity amounts, figures cash and discount amounts, and automatically enters both on a combination invoice-shipping form.

Schweber is a specialized company in the field of electronic components distribution. Where most distributors merchandise as many as 300 product lines, Schweber concentrates on 10 which it feels best serve its customers' needs. The company is obliged to keep a large on-shelf stock, but, in the words of Seymour Schweber, its president, "Having merchandise in stock is hardly enough. We must also be able to move it out fast."

"In fact," he added, "almost all our orders are received by telephone. They are contingent on our ability to ship all or part of the order almost immediately. A formal purchase order usually arrives a week or two weeks after shipment."

Red is for rush

"In actual practice," he continued, "most orders received today are now shipped today. Previously when three billing clerks typed bills on an ordinary typewriter and figured amounts manually on desk calculators, they were unable to stay current with the order flow. On a high-volume day, 25 percent of the orders otherwise ready to be shipped were held up until the next day. Absences in the department had the effect of putting us still further behind."

The present system has negated the billing problem. When a salesman receives an order, whether by telephone or in the customer's office, he writes up a worksheet or order form in which he lists each item by number, description, quantity ordered and adds special instructions as well as unit prices.

This sales order becomes the worksheet for order filling in the office. It is first edited and complete header information is inserted manually. If spaced or timed shipment (part now—part later) is called for, a second packing sheet is attached to the back of the form to be filed by date for filling according to the requested schedule.

These sheets are color-coded. Red is used for orders which the customer requests on the same day. Green forms of special design are used for partial orders held for future delivery.

When item numbers and amounts are manually verified, the worksheet goes to the warehouse section where the items are "picked" from the shelves and inspected. They are collected in baskets as they move down a conveyor system or packing line. At the end of the line, which terminates on a table adjacent to the billing office, a final check is made to be certain that proper quantities and items have been selected.

The worksheet is carried into the billing department, and a supervisor, referring to a card file, inserts full and proper heading identification and determines whether more than the standard three invoice copies are needed and whether special "performance guarantee" forms are required. If so, they are attached to the back of the standard inter-leaved forms in use.

At this point the IBM 632 Electronic Typing Calculator is put to work. This machine consists of a standard IBM electric typewriter and a small companion keyboard, both cable-connected to a compact computing unit, which in Schweber's case is stored in an adjacent room.

The 632 operator types invoice heading information, the item number and description. The quantity ordered and unit price are entered from the companion keybord. The machine is programmed to multiply quantity by price and to store the computed amount in its memory core after the information has been typed on the form.

If a discount is involved, the machine applies the proper discount percentage, figures the amount and automatically enters the proper allowance.

Total for each item is retained in the memory unit until the accumulated total is brought forward to the end of the invoice. The 632 then automatically enters the total invoice amount.

Under program control, the 632 automatically tabulates, spaces, types and advances the form to the next line when each entry has been completed. This means the typist need not do the aligning.

No time for errors

As an added advantage, the memory unit is capable of carrying forward a daily total of all billing and totals for any other three areas of information. For example it is possible to get total item quantity and dollar amount of business written on any one line and to produce two other specific sub-totals—by product, by manufacturer, by geographical area or by any breakdown desired.

This gives Schweber a semi-detailed analysis of the day's business. This information is put to work in adjusting inventory, placing of orders to component manufacturers and spotting trends.

Errors previously found in manual calculating, copying and the transposition of figures have been eliminated by automatic calculating and printing. This, Mr. Schweber stated, has speeded the entire operation and produced a greater order output. In turn, shipments of more orders on a same-day basis has increased.

To this extent, he concluded, the system is a sales tool as well as a data processing unit. ■

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An MBA News Feature

Chicago Bank Processes Checks On Univac II

AFTER six years of research and planning, the Harris Trust and Savings Bank in Chicago became the first large bank in the country to process all of its demand deposit checking accounts on large-scale computing equipment.

Using a Univac II and peripheral equipment supplied by Remington Rand, the bank has also transferred a large portion of its stock transfer account records to magnetic tape for computer processing. The conversion of personal trust accounting is now in the test run stage. Both are expected to be fully operative this year.

(Harris Trust is actually the second bank to convert its checking accounts to computer handling, since the United States National Bank in Portland, Ore., has been using an IBM 650 in its system for more than three years. The Harris installation is the first using a large-scale computer.)

At a special preview showing of the Harris-Univac system in action, Kenneth V. Zwiener, president of Harris, pointed out that the system was the result of long range planning and research. The first Operations Research department was set up in 1953 to study equipment and methods available. By 1958, it had been decided to enter into an agreement with Remington Rand to locate the Univac Computer Service Center in the bank building with the bank enjoying prime time privileges.

Guest speaker at this meeting was Gen. Leslie R. Groves, vice president of Remington Rand, who stated that the Harris installation represents an accomplishment in fact, not just a projection of an idea. "Too much credit today," he noted, "is given to 'what is going to be done,' but this represents something that has been done."

Mr. Zwiener stated that at the present time the bank is using about three hours of computer time each day to run its checking application, processing approximately 62,000 checks a day.

Kenneth V. Zwiener, president of Harris Trust and Savings Bank, Chicago, and Gen. Leslie R. Groves (right) vice president of Remington Rand, inspect the bank's new Univac system.

In addition five hours is utilized in programming and debugging operations for the ultimate total conversion of the stock transfer and personal trust accounts applications.

The bank eventually plans to use about 6½ hours of prime time for all of its needs. The remainder of the Univac's time is now taken up in Service Bureau work by Remington Rand.

Commenting on the personnel handling the new operation, Mr. Zwiener emphasized that "all people whose work has been taken over by the new installation have been placed in more interesting and challenging work."

Many people from the former bookkeeping department, for instance, are now working as keypunch operators, preparing cards as imput. Other bank personnel now function as programmers and in systems work connected with the computer program.

Maurice K. Heald, vice president of the bank and head of the operations research, explained that a large area of study is now under way to associate the bank's computer operation with magnetic ink developments. Harris, he said, will be ready to convert as soon as it is considered expedient to move to magnetic ink processing.

He also visualized other functions of the computer in the future. "The day will come," he said, "when this installation will be used for all volume account processes, for compiling statistics to assist management, for economic studies and surveys, and for other needs not even foreseen today."

A Custom-built System for VA Records Retrieval

A UNIQUE, "custom-built" records retrieval system has provided the vital link in a vast data processing program expected to evolve into the most completely automated insurance system in existence.

The program is being undertaken by the Veterans Administration's Department of Insurance, ranked as the world's second largest ordinary life insurance company (Metropolitan is the biggest). Within the next 16 months, the VA's new "multifunction" magnetic tape computer system will be handling more than six million accounts with a face value in excess of $43 billion.

The records system, located in the department's largest district office in Philadelphia, was integrated into the burgeoning network of automated data processing equipment last year, essentially to speed recovery of policyholders' case histories for processing correspondence, claims, underwriting and similar actions.

The thorn of automation

As Frank J. Hoesch, district office manager, pointed out, the changeover to magnetic tape processing immediately presented the department with two of the thorniest problems that can arise in automating insurance procedures. Simply stated these were the economic maintenance and rapid and accurate retrieval of case history material.

Accumulation of such information on tape would necessitate the storing of far more reference reels than would be practicable, he added, yet such information is important to many daily transactions.

The recovery of this historical data was difficult enough before the computer system, he emphasized, when posting of the various records was handled manually. Now an IBM 705 electronic data processing system is absorbing the posting and the manual records have been eliminated. This leaves the daily transaction list as the sole source of historical reference.

To provide a fast and accurate method of recovering this past information, representatives of the VA, working with Minnesota Mining and Manufacturing Co., developed a specially designed Thermo-Fax Selective Copier which can retrieve case history data from printed lists, one at a time. Present plans calls for delivery of 20 of these machines—12 to be used in the Philadelphia office and four each in the department's other two district offices in St. Paul and Denver.

The machine is mounted on a rolling desk-and-chair assembly unit, attached to one side of Trans-Dex files. It glides on casters, permitting easy access to any segments of the files. Both the assembly unit and the files were supplied on special

Mobile units carrying operator and a Thermo-Fax Selective Copier move up and down rows of Trans-Dex files which hold historical data on six million VA insurance accounts.

order from the Rol-Dex division of Watson Mfg. Co., Inc.

The magazine-type files house index guides designed by Smead Mfg. Co., which segregate transaction list material according to normal numerical sequence of the days of the year, i.e., from one through 366.

30 seconds to strip

When information on an account is required by any of the district office's divisions, a "status request" sheet is prepared. A card is punched from this sheet, and, along with other transactions for that day, the card is converted to tape. The computer, in turn, produces a Record Print Out, reflecting all pertinent details, contractural and otherwise, of the account in question.

If additional data on previous transactions is required, a notation is made on the RPO to indicate the extent of the background information desired. The RPO is then forwarded to a Thermo-Fax operator in the records area. She needs only three entries imprinted on the RPO to facilitate her search for past transactions. These are the file and

Operator inserts transaction list into the machine and copies line or lines of data requested. Information is then automatically "sliced" off on strips of paper which are relayed to division making the request. The list is returned to the file immediately.

Francis S. Ashley, left, assistant district manager, and Martin M. Grossman, chief, Accounts and Underwriting division, stand near one of the IBM 720A tape-to-print units which are a part of the VA's new "multi-function" magnetic tape computer system.

policy number of the account and the last day it was processed.

Using this information as a guide, the operator extracts the proper transaction list from the Trans-Dex file and inserts it in her machine. The line, or lines, of data requested is selected by positioning a row of pin lights which extends across the width of the transaction list sheet. She then depresses a button at the right of her machine which activates a roll of copy paper.

The data is copied, instantaneously and in dry form, and then automatically "sliced off" on strips of paper measuring three and one-half inches in length. These drop into a receptacle at the base of the machine. The strips are relayed to the divisions requesting the information, and the transaction list is replaced in the file. At this point the Thermo-Fax operator's work is done. It takes an average of less than 30 seconds to complete the entire operation.

VA officials report the Thermo-Fax unit will accept pages of any length up to 15 inches wide. Single lines containing a maximum of 120 characters may be copied, and by touching a "multi-print" button, as many as seven lines may be reproduced.

This breakthrough in record retrieval marks another exciting chapter in the department's mechanization story.

The current ADP program is the result of a series of studies originated as far back as the early 1950's. A variety of mechanical devices, applied gradually to insurance operations over the years, played important roles in reducing the department's annual administrating expenditures by more than one-half in the period 1952-59.

Eyes on the target

In January, 1957, new studies were intitiated to consider the feasibility of combining the activities of all three district offices in a central computing system. Ambitious as this project appeared, the VA found it could be achieved; and a target month for completion, August, 1961, was established.

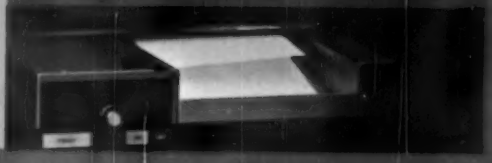
The lion's share of the department's more than six million accounts—almost two-thirds—is processed at the Philadelphia office, an amalgamation of a number of former insurance offices consolidated by the VA in recent years. On an average day, this office will handle about 60,000 premium payments as well as many other items covering everything from remittance notices to loan and surrender applications.

Under the direction of Sumner G. Whittier, then chief insurance director and now administrator of Veterans Affairs, examination of all operating

Continued on Page 44

Now! office copying
enters the age
of automation

. . . copying costs
dramatically cut!



In 1950, Haloid Xerox Inc., of Rochester, N. Y. introduced the first commercial application of *xerography*, a clean, fast, dry, electrostatic copying process. Haloid Xerox management saw in this new way of creating permanent images on paper a way to save industry, business, and government thousands of dollars annually in copying costs. Now, after nine years of research, the advantages of xerography have been incorporated into an amazing *office* copying machine . . . the new Haloid Xerox® 914 Office Copier.

Fundamental new way of office copying

Xerography made fast, inexpensive copying possible. The new XeroX® 914 Office Copier brings it to the business world. Never has there been an office copier like this before! It makes copies on your own letterhead, ordinary paper (plain or colored), vellum, or offset paper masters. As many as 6 copies a minute. And the quality of reproduction is superb. The new XeroX 914 is more than a new *way* of office copying . . . it represents a major breakthrough in the application of automation principles of office copying. *Magic* . . . at your fingertips!

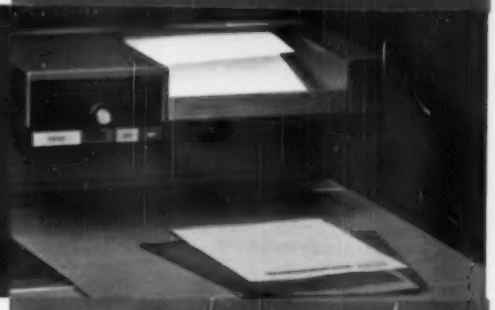
NEW XEROX 914

OFFICE COPIER

Since there are no adjustments to make with the 914, and no exposure settings, there's no waste of materials. You just push a button, and the copies *flow*. Each copy of the original, from first to last, is a *perfect* copy. Add to this *material* saving the fact that neither expensive sensitized paper, nor intermediate film negative, nor liquid chemicals are required, and you can see how copying costs are slashed with XeroX 914. Think how much this ingenious office copying machine can save *you* in a week, a month, a year's time—in supplies alone!

No exposure
adjustments
... no waste
... no wet chemicals

Just
push a button
... copies flow!



The new XeroX 914 Office Copier copies everything written, typed, printed, stamped, or drawn. Copies from *any* original—letter, invoice, statement, receipt, contract . . . even pages in thickbound volumes. Copies all colors, including reds and blues, with sharp black-on-white fidelity. Nothing is left out. Every copy is error-proof, and legally acceptable. Why make copies by hand or "by guess" when a XeroX 914 can do the job so much better. Designed specifically to fit the needs of the modern office, it saves time and money.

Copies everything
... never misses
a color!

NEW XEROX 914

OFFICE COPIER

N

Anyone can make perfect copies... every time

Anyone is an *expert* the first time he uses XeroX 914 Office Copier. It is the easiest of all office copying machines to operate—for multiple copies or just one. You simply place your original document face down on the scanning glass, select the number of copies you want, and push the "Print" button—that's all. From that point on the machine operates by itself, automatically printing perfect copies until it reaches the quantity you designated. This is one of the reasons why the XeroX 914 does such a big job at such low cost. You get out paperwork *fast*.

Prints multiple copies automatically

About 1¢ per copy for supplies!

There's no feeding of copy paper or rehandling of original with a XeroX 914 Office Copier. The original is handled just once. *Any number of copies, delivered automatically.* This is xerography teamed with automation, the NEW DIMENSION in office copying. It gives you unlimited copies at the touch of a button—at a cost of about 1c per copy for supplies. To get complete information about this new way of visual communication that cuts costly office paperwork, write on your letterhead to: HALOID XEROX INC., 9X-1 Haloid Street, Rochester 3, New York.

NEW XEROX 914

OFFICE COPIER

Since there are no adjustments to make with the 914, and no exposure settings, there's no waste of materials. You just push a button, and the copies *flow*. Each copy of the original, from first to last, is a *perfect* copy. Add to this *material* saving the fact that neither expensive sensitized paper, nor intermediate film negative, nor liquid chemicals are required, and you can see how copying costs are slashed with XeroX 914. Think how much this ingenious office copying machine can save *you* in a week, a month, a year's time—in supplies alone!

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Copies everything
...never misses
a color!

NEW XEROX 914

OFFICE COPIER

A "Listomatic" camera photographs catalog copy set on tabulating cards at speeds up to 230 per minute. The processed negatives are then laid to printing flats for offset reproduction.

Cards and Camera Speed Catalog Production

By Robert Minor

PREPARING, updating and printing catalogs, parts lists and price lists for distribution to the vast dealer organizations of seven General Motors Corp. divisions is a massive job. To get these vital lists into the hands of the dealers in the shortest possible time at a reasonable cost, the Typographic department of GM Photographic in Detroit developed an automated system which has cut 30 days from the preparation time previously required for publishing.

The average catalog or price list runs to 30,000 or 40,000 items and may be distributed quarterly or monthly, depending upon the requirements of the division involved. Before the new system was instituted, the department requested 40 days of "lead" time to set the type, proofread the copy, make page layouts and print. Proofreading alone took as many as 1,500 man hours in some cases because of the large amount of material and the necessity for complete accuracy.

Delay in getting these lists to the thousands of automobile and truck dealers throughout the country can be an expensive proposition and cause delays in customer service. There were cases when a manufacturing division was willing to spend extra thousands of dollars to deliver up-dated price lists to the dealers a day early.

Department manager Lawrence E. Rosenthal has been fighting the delay problem for many years. Many methods were tried, he said, including the use of "hot" (standard letterpress) type, flexoprint panels and addressograph plates. These processes all worked, but the speed achieved did not meet his demand. After much study and investigation, his department came up with a system that utilizes many of the latest developments in camera techniques, typewriter composition and photographic know-how.

By setting one, two or three lines of typewriter type on a tabular card and feeding these cards into a "Listomatic" camera (Recordak division of Eastman Kodak) at speeds up to 230 cards per minute, the department can photograph thousands of lines an hour, process the film, and set the negatives up in printing flats ready to be made into offset plates.

The use of tab cards as input for the camera has made a tremendous contribution to the speed of preparing copy for publication. The first time a catalog or price list is readied for printing, the

copy is set on Vari-Typer units, Justowriter equipment (Friden, Inc.) or on standard electric typewriters equipped with card-holding platens. Choice of the equipment is determined primarily by the customer (manufacturing division) with typeface and method of maintaining the card files as important factors.

In original form the cards (by Standard Register Co.), are on continuous stock. If the Friden equipment is used, the copy is first set on a Recorder which produces a punched paper tape. This tape, in turn, is placed on a Reproducer which automatically sets the information in justified lines on the card stock. A pin-feed platen assures proper registration on the cards, while a code in the tape advances the form into the correct position for receiving the copy.

The cards are then die-cut on a Standard Register unit and key-punched with code holes which tell the camera how many lines to photograph on the individual card.

If the copy is set by the card typing Vari-Typer or standard electric typewriter, it is set directly to the die-cut card. All copy must be set in justified lines to give the finished "printed" look and to assure that all the necessary information is copied by the camera.

Maintenance of the cards plays an important role in keeping the system at peak efficiency. There are several choices open to the customer. GM Photographic can prepare and maintain a card file for any division, making price corrections on individual cards as the new information comes in. It can also accept copy changes on punched paper tape which is run through the Reproducer to prepare new cards. Both are customer services offered by the department. The most efficient method, however, is for the division to maintain its own card file.

In any case the cards are housed in standard card file units (either at GM Photographic or at the manufacturing division). They are hand-filed into drawers in page sequence. The thousands of cards that go to make up a catalog or price book also include heading cards and others (color-edged) which identify blank spaces, page locations and miscellaneous information pertinent to the printing of the pages.

If the originating division maintains its own

Catalog or price list copy is assembled at GM Photographic (top photo) and then typed on continuous card stock (center photo) by Justowriter equipment. Cards containing copy are die-cut (bottom photo), key-punched and fed into the camera.

All Photos by GM Photographic

Customer copy can also be typed on the cards by a Vari-Typer unit (top photo) and later filed by hand in drawer files (center photo). When it is time to print, the cards are packed in transfer boxes and delivered to GM Photographic for photographing.

file, daily changes and corrections can be made by the division office typists using the card typing units. This reduces peak load problems arising when the printing deadline nears, and more important, it means that corrections are up to date and proofreading has been done on the spot—placing this major responsibility in the hands of the division.

When it is time to print a new catalog or price list, the cards are placed in transfer boxes and put in plastic bags to keep them clean and in order. They are delivered to GM Photographic by truck, arriving ready for processing by the camera. Once they are moved through the "Listomatic," they can be repacked in the transfer boxes and returned to the originating division where they are put back into the drawer files.

Mr. Rosenthal pointed out that it isn't possible to calculate how much money the system has saved in terms of dollars and cents, but he emphasized, savings in time with this operation has been much greater than with other systems tried.

There are, he added, other advantages in using the tabulating cards and the high-speed camera. The same deck of cards can be used in preparing inventory and order pads. Any set of item cards can be selected, along with space and header cards and run through the camera in any sequence desired. The negatives produced are processed and then form rules can be "double printed" (added to the list photographically) to produce a ruled and printed inventory or order sheet.

In Mr. Rosenthal's estimation, the system could be developed to reach the peak of efficiency if it is applied at the point where original information on parts and prices are first recorded. Here this first-written material could be processed through Friden Flexowriter or Underwood "Data-Flo" equipment, reduced to punched paper tape, and then converted automatically to justified lines of copy on the tab cards, eliminating any further writing except for updating and corrections.

The problem of printing updated price sheets, catalogs and parts lists plagues many companies. No printing department has yet been able to deliver the desired material "yesterday." But GM Photographic has proven that the techniques of automation combined with new advances in the photographic arts have reduced a tedious and time-consuming job to a simple, and effective, system. ■

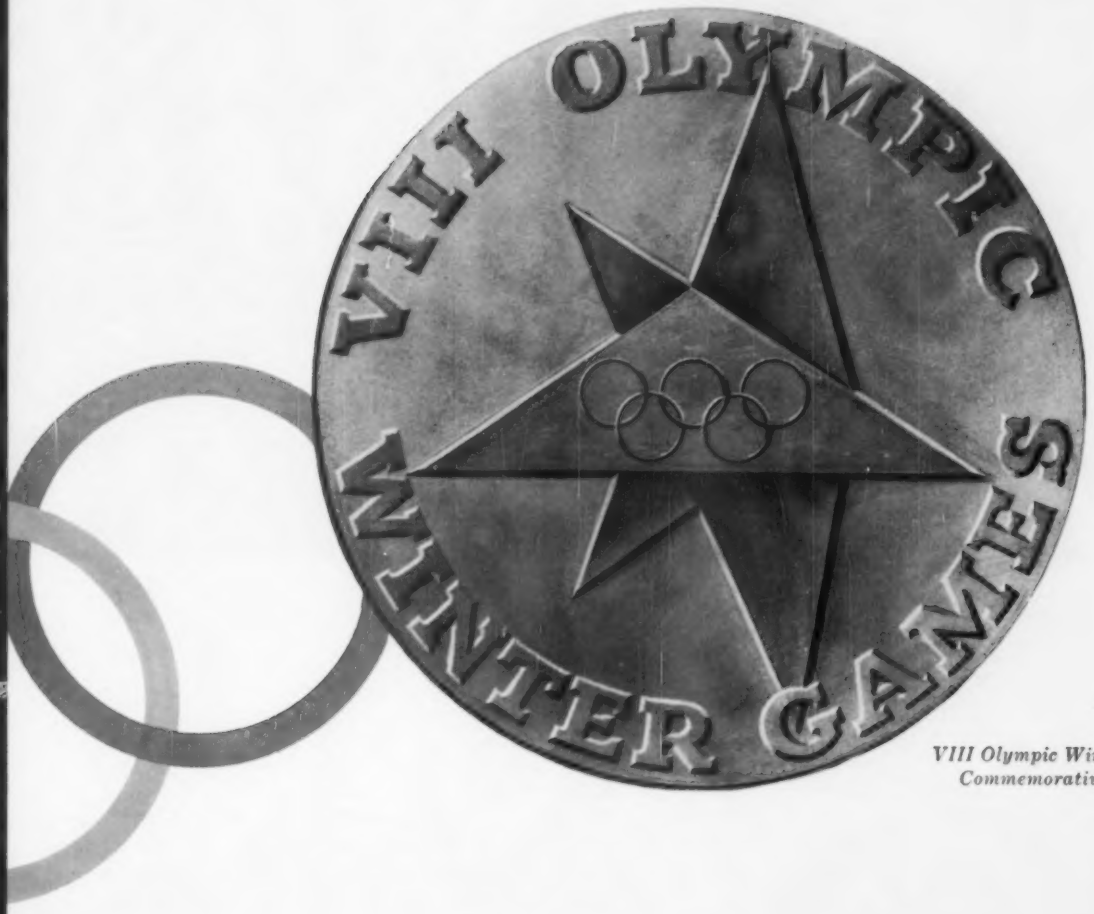
IBM RAMAC® 305 SCORED THE WINTER OLYMPICS

More than 3 million visitors saw the IBM RAMAC 305 *in action at Moscow and Brussels.*

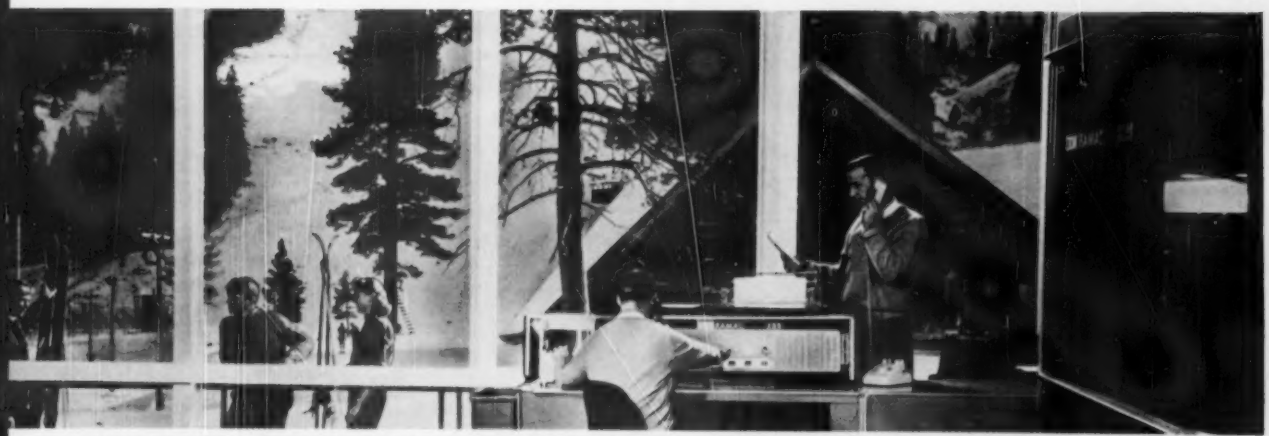
Squaw Valley, California: At the Winter Olympics in February, this IBM Data Processing System gave results of each event almost before the last contestant could catch his breath. Minutes after an event was completed, results were flashed to the judges and information centers.

The key to the speed and versatility of this system is RAMAC's exclusive random access capability. This capability makes it possible to process information in the order received while, at the same time, updating all related records on file.

Throughout the world RAMAC is helping to solve the problems of business with speed and economy. Whether purchased or leased, RAMAC can be profitable to your business, too.



VIII Olympic Winter Games
Commemorative Medal



As each competitor finished his event, word was flashed directly to RAMAC. Here, where almost a million words of Olympic data (in both English and French) were stored on the disk file, RAMAC consulted the rules, computed the scores and printed out a new list of standings as affected by the latest contestant's results. After the event was completed, RAMAC punched out a paper tape for wire services communication. Final results were printed on duplicating masters for prompt press release preparation.

balanced data processing **IBM**®

The Big Count

Continued from page 19

Census Chief inspects one of the Univac high-speed printers which will produce printed reports at speeds of 600 lines-per-minute. Two of these printers will handle output of census data, expected to total some 100,000 pages in final form.

a means of recording Census information for mechanical sorting and compilation. At the same time he devised electrically operated mechanisms which performed adding and counting operations when actuated by punched cards. Mr. Hollerith's inventions not only solved the Census problem, but made the punched card an inseparable part of American business record keeping. It was his company—the Computing-Tabulating-Recording Co., founded in 1896—that became the corner stone of the great IBM empire.

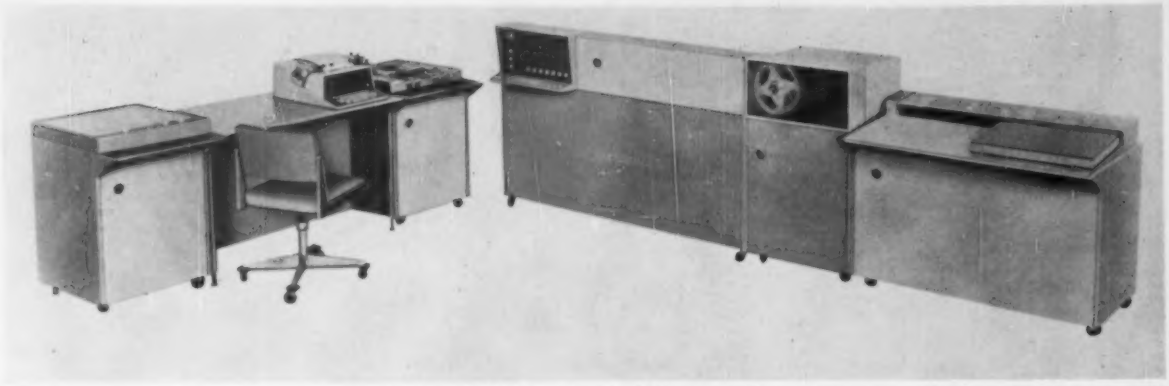
A decennial custom

The Bureau switched to computers in 1951 when it installed two Univac I systems and since that time has logged more than 80,000 hours of computer time on them. The 1105 Univacs, costing $2,400,000 each, were installed early in 1959, and were used to complete processing of the special 1958 economic census. Prior to their installation, 15 employes of the Bureau were trained for programming and engineering on the new system at the Sperry-Rand Computer Center in St. Paul, Minn.

This is the 18th time in history that the United States is undertaking a population inventory; a custom ordered by the Constitution adopted in 1787. Each decade the job becomes bigger and more complicated, and each decade—due to constant research and development by the Bureau's staff—the results are produced with greater speed, efficiency and accuracy.

Even now, plans are underway for new methods to handle the next "big count"—the 1970 Census. If the present rate of population increase continues, this next report will cover over 216,000,000 Americans—but past performance assures that the Bureau of the Census is equal to the task. ■

"Don't shoot, Boss! We had the tapes in backward."



The basic RPC-9000 system includes central processor, magnetic tape file, tape punch, photo tape reader, and input-output tape typewriter system.

Royal Precision's New RPC-9000 System

THE RPC-9000, a new, modular electronic computer system, application-engineered for the full range of data processing systems, has been announced by the Royal Precision Corp. It will be marketed by Royal McBee Co., co-owner of the firm. Fully-transistorized, the RPC-9000 provides automatic "in-line" records processing. Data is accepted in random order, and all affected records are automatically updated in a single, uninterrupted sequence of operations.

The basic system includes: a central processing and control unit which operates in microseconds, performs the calculations, controls the program, and searches the external memory tape; a continuous magnetic tape file for data storage; and an input-output tape typewriter system that reads paper tape at 60 characters per second and punches tape at 30 characters a second.

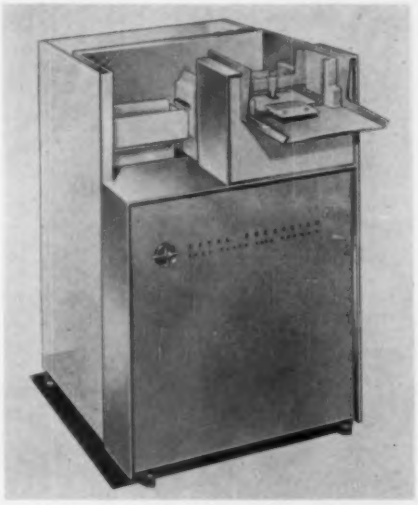
Optional units include: a 400-cards-per-minute photoelectric reader for rapid 80-column punched card input; a 500-characters-per-second bi-directional photoelectric paper tape reader; a 300-characters-per-second tape perforating unit; a 150-lines-per-minute printer; and a high speed, 1,000-lines-per-minute printer. Both printers have 120-character line widths.

Information can be entered into the computer from punched paper tape, punched cards or through the typewriter keyboard. Programming flexibility is provided by 43 "commands." Internal operating memory is capable of storing 432 instructions or 72 12-character words of data. This can be expanded to some 2,000 internally-stored instructions or 328 words.

The basic system requires only 150 square feet of floor space and is said to require no airconditioning and little or no site preparation.

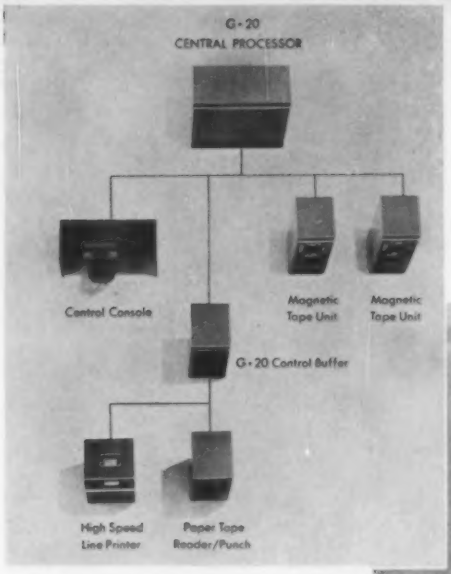
No special power is necessary, and the system is protected from power failure by a built-in "on-line" emergency power supply. The RPC-9000 is available on lease, lease with option to purchase or for purchase. Monthly rental for the basic system is approximately $2500.—Circle No. 4-21

An MBA Product Preview



The 9460 photoelectric punched card reader can handle 400 cards per minute as input for the system.

Two high-speed printers are available with the system. One prints out 120-character lines at 150 lines per minute and the other up to 1,000 lines per minute.



Modular components which go to make up the new G-20 general purpose computer system.

An MBA Product Preview

The Bendix Business Data System

Streamlined G-20 control console.

STRESSING expandability and versatility, the Bendix Computer Division of Bendix Corp. has entered the business data processing market with the G-20 general purpose computer.

The modular G-20, Bendix spokesmen said, provides the features needed for small and large-scale commercial or scientific applications. A fast, central processor can be coupled with peripheral equipment that operates concurrently with, or independently of, the computer. Using any number of modular units, the user can change the nature of his system at will, since all elements of the same type are interchangeable in the various systems.

For business data processing, with input and output units operating concurrently, a system can be developed by combining a central processor, control console, card equipment with couplers, magnetic tape units and control buffers. A scientific system can be assembled from a central processor, control console, magnetic tape units, a card and printer coupler, a high speed printer and punched card equipment. At the same time, an independent system for tabulation of information held on magnetic tape can be assembled by connecting a magnetic tape unit, a card and printer coupler, a high speed printer and a control buffer.

The central processor is capable of 45,000 additions per second. It is built of solid-state components and includes a random access and expandable magnetic core memory. The basic memory contains a magnetic core module of 4,096 words, but up to seven additional memory modules may be added to enhance its power. Two types of additional memory modules are available. One is the basic type which acts as a direct extension of the internal memory. The other is a communication module which acts as a memory extension and provides facilities for direct input and output of external information.

A major feature of the new system is a supervisory routine which allows the central processor to delegate authority to control buffers, permitting the processor to spend a high percentage of its time computing, while the control buffers direct input-output operations.

These buffer control units provide the key to the system's versatility. They are equipped with 1,024-character magnetic core memories for storage of data and commands and facilities to control the flow of information along either of two communication lines. Information is transmitted between the control buffer and central processor at a rate of 143,000,000 eight-bit characters per second, a rate much higher than that at which input-output devices operate. The buffers operate as intermediaries between the computer and input-output devices, permitting a number of input-output operations to be handled concurrently.

Other new components in the system include: high-speed printers which operate at speeds of 600 to 1,250 lines a minute on forms up to 120 characters wide; magnetic tape units; read/punch paper tape stations, which can be used under program control in both on-line and off-line operations, and card and printer couplers.

Both scientific and commercial programming systems are available, provided in either magnetic tape, punched paper tape or card form. Circle No. 4-18

UNITRAY works for you . . . around the clock

The UNITRAY system of vertical card handling is the only ***complete*** system available today for use throughout your department. As a pocket of a sorter rack, a compartment of a truck, a drawer in a file or as a combination feeding and receiving tray, UNITRAY performs with ease and speed. In addition UNITRAY eliminates card juggling, protects cards and ***cuts travel time by as much as 50%***. The UNITRAY system reaches peak efficiency when integrated completely within the department.

If you're not now enjoying the benefits of UNITRAY'S ***around the clock performance,*** why not drop us a line? A Card Handling brochure is yours for the asking. Upon request, we'll also undertake a Card Handling survey.

THE Wright LINE

DATA PROCESSING ACCESSORY EQUIPMENT

THE WRIGHT LINE, INC. / 160 GOLD STAR BLVD. / WORCESTER, MASS.
In Canada - THE WRIGHT LINE of CANADA LTD. / DON MILLS TORONTO

VA Records Retrieval

Continued from Page 28

procedures was begun 27 months ago. By December, 1957, program training had been intensified and expanded. The following month, site preparation for installation of the 705 system was underway.

In December, 1958, an IBM 305 RAMAC joined the growing battery of equipment needed to handle the conversion of old—and issuance of new—policies. By July, 1959, the initial complement of 705 equipment was installed in a special "building within a building," constructed on the main floor of the Philadelphia office. Resting on the upraised floor of this "building" are more than 20 units of the system, inter-connected for on-line operations. Another nine are handling off-line card-to-tape, tape-to-card and printing duties.

The first application was started in October, 1959, comprising the daily processing of about 600,000 policies, paid for by the allotment deductions of in-service personnel. Next slated for conversion are accounts for which premiums are deducted by one of the regional offices from compensation and pension cases and paid to the Philadelphia office to apply to the individual accounts concerned. Following this, accounts which are paid directly to the VA by the insured will be converted.

The latter applications will include premium posting and billing, loan and lien and dividend accounting and the processing of renewals and lapses—all on a daily basis. Monthly, semi-annual and annual applications will include statistical summarization and reconciliations of various data, preparation of an actuarial in-force file and updating of dividend rates in the master file.

In place of individual policy and allied records for the six million accounts formerly retained, the department will have a master record file of fewer than 100 reels of magnetic tape, each containing about 70,000 records.

Look to the West

Already the system has streamlined the erstwhile part-manual, part-machine operations required to process the continuous incoming and outgoing data that passes through the office. For example, it is no longer necessary to use an electronic calculator to determine whether premium payments have been received on or before expiration of the standard 31-day grace period. Instead, the system verifies this information during its daily remittance run.

By discontinuing the use of premium posting cards, the need for listing payment notices by an accounting machine upon receipt was eliminated. Instead, following daily reconciliation of funds received, these notices are converted to tape. The tape is then used to update the master file.

In addition, the system prepares an auxiliary tape for printing single-line entries on standard transaction lists. There are generally about 150,000 of these entries printed each day for all accounts processed. The lists are filed by the Thermo-Fax operators for retrieval of case history information.

The system similarly bypasses the manual operations formerly required in processing dividend payments, policy renewal and lapse actions. During the daily billing run, the computer selects both the accounts to which dividends (cash, deposit or credit) are due, and those needing renewal/lapse notices. These notices, as well as authorization of dividend or refund disbursements, are released automatically.

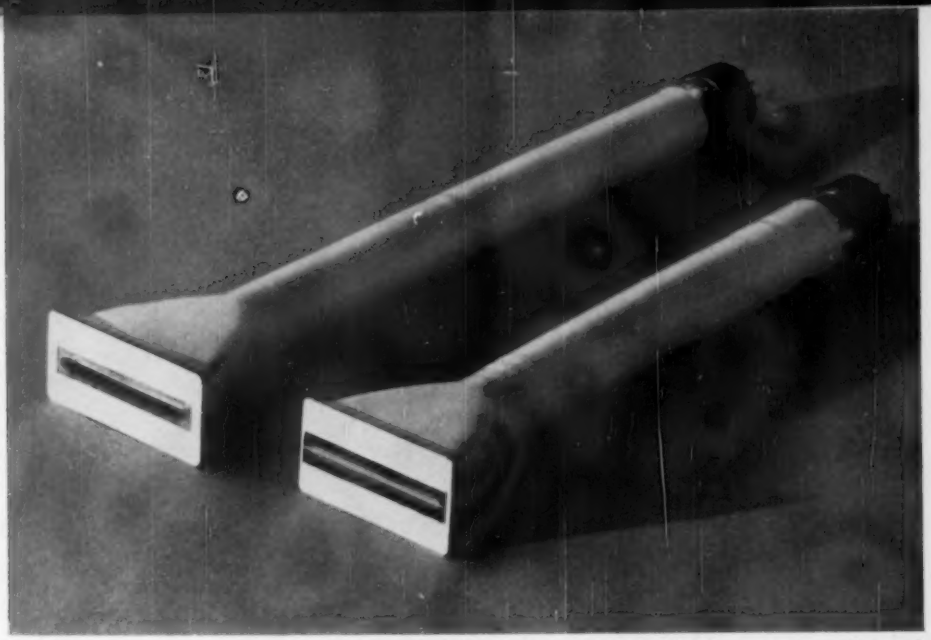
Future plans for the system will culminate in conversion of records maintained by the two western offices. Change-over operations for the Denver office are scheduled to begin in November with St. Paul following in February, 1961. VA spokesmen estimate that, by means of high-speed wire transmission of data, 705 processing of records for all three offices will be a reality six months later.

Wire from St. Paul

As an example of the future operation: If the St. Paul office requires information on the status of an account as of the close of business on a Monday afternoon, that office prepares the request in punched-card form for transmission over the leased wire circuit. Immediately upon receipt of the request in Philadelphia, it is converted to tape for processing during the regular updating run for Tuesday.

The computer prints out the full record of the account, and this Record Print Out is then airmailed to St. Paul on Tuesday night. Optimum scheduling, the VA reports, will permit the RPO to be at the St. Paul office when it opens for business on Wednesday morning—less than 48 hours after the request was first issued.

VA officials have expressed the belief that savings of about $1.5 million annually will be effected once the over-all system is in complete operation. But whatever the final benefits, the "custom-built" records retrieval system has already made a significant contribution to the VA program, emphasizing the validity of one of the VA's guiding principals, as enunciated by Mr. Whittier: "... the exercising of constructive leadership in the field of veterans' affairs ..." ■



"Printapix" cathode ray tubes effect direct image transferal at high speeds on uncharged media. One tube permits dry developing; the other features a two dimensional head for sequential line scanning.

New Cathode Tubes Print on Paper

An MBA News Feature

Two new cathode ray tube types, called "Printapix," have been developed by Litton Industries for direct electronic printing at high speeds on low-cost, non-sensitized material—such as ordinary paper.

Printapix, the company stated, is already being incorporated in facsimile, address labeling and television-type image reproduction equipment, employing a metallic element mosaic target or printing head in place of the phosphor screen usually found in cathode ray tubes. Other applications soon will include high speed computer readout, controlled information storage and erase for military tactical display maps and stock control uses, projection transparency generation, multiple copy reproduction and simultaneous recording at any number of dispersed stations, according to Norman F. Fyler, director of Litton's display devices department of the Electron Tube Division.

In the commercial field the tube is expected to speed up transmission messages and provide a permanent record of such messages in such areas as inventory control offices, in warehouses, yard control operation in railroads, weather mapping, news transmission and multi-reproduction.

This cathode ray tube incorporates several advantages over former methods of accomplishing electronic reproduction, Mr. Fyler stated. It simplifies results from the direct coupling of electrons to non-sensitized base dielectric material without conversion to light and use of optics. Paper with a glossy surface, commonly used in many printing applications, will provide excellent results. Various transparent media, such as glass and thin transparent plastic may also be used with Printapix, depending on the application.

Operating circuitry and components of the tubes are similar to those normally used for display, readout or oscillographic applications. Ordinary television components and techniques are said to be quite satisfactory in many instances.

The Litton type L-4013 tube provides a printing or writing head 0.15 inches high to accommodate writing of complete characters or symbols across the entire head width. This two dimensional head may also be used for sequential scan line operation. The L-4016 model has a uni-dimensional conductive element array for sequential scan line operation.

The first showing of the two tube types was held at the Institute of Radio Engineers exhibit in New York City, on March 21-24. Both models Fyler said, are available for immediate delivery. Tubes with up to 12" printing head width can be produced to specific order.

An MBA
Product Preview

Fred R. Sullivan, president of Monroe Calculating Machine Co., is pictured here with the compact new Monrobot Mark XI, a solid-state general purpose computer in the $25-30,000 price range.

Monroe Unveils General Purpose Computer

THE MONROBOT MARK XI, described by its manufacturer as the world's first general purpose computer capable of serving the needs of the largest corporation, yet priced within reach of the small business, has been introduced by Monroe Calculating Machine Co., division of Litton Industries.

Price of the new electronic unit is $24,500. Monroe spokesmen stated that because of versatility and performance combined with its "sharply reduced cost," the Monrobot may reverse the trend toward centralized data processing.

It was pointed out that "the price of the computer will not only make it possible for the smaller businessman to enjoy economies heretofore limited to larger corporations, but will make it possible for larger corporations to process data in branch offices."

The computer requires less space than an office desk and weighs 300 pounds. It is fully transistorized and operates from a standard AC wall outlet, with no air conditioning required. The unit can process and "understand" both alphabetical and numerical information.

The Monrobot has a solid-state logic unit which is controlled by as many as 2,000 instructions stored on a magnetic drum. These instructions, such as add, subtract, and compare are located and executed at an average rate of 12 milliseconds each, including access time. The logic unit simultaneously translates, verifies and edits alpha-numeric data from independent input devices. It requires no carriage or plugboard programming, plugboard format control or tape language-translating equipment.

Any three separate input or three output devices can be plugged into the computer and operated simultaneously. On input, one tape device can enter old data, a second can enter new data, and a third device (either a typewriter or numerical keyboard) can be used to enter exceptions and to make changes. This typewriter can also be used to make alpha-numeric data and program tapes.

On output, one typewriter can be used to prepare invoices, checks, bills of lading or other records. A second typewriter can be used to post all, or any part of, the alphabetic and numeric transactions. A third output device can be used to record the transaction history in either punched tape or card form.

The 9000-digit storage drum, according to company officials, allows retention of more totals, more constants and more program steps than any other low-cost electronic accounting or billing machines. Several programs can be stored simultaneously, and these may be selected as desired by pressing a single key.

The machine is capable of unattended operation when input is entered by tape or cards. Complete accounting routines can be executed by one-key depression. Monrobot reads and translates data, computes and prints out answers and updates stored data for later use, all in a single operation.

Each of the 1024 storage registers in the machine can contain one number or word or two program instructions. The magnetic drum revolves at a rate of 5,200 times a minute, and data flows to and from the drum in the form of electronic impulses at the rate of 160,000 a second. The Monrobot handles about 5,000 arithmetical computations a minute.

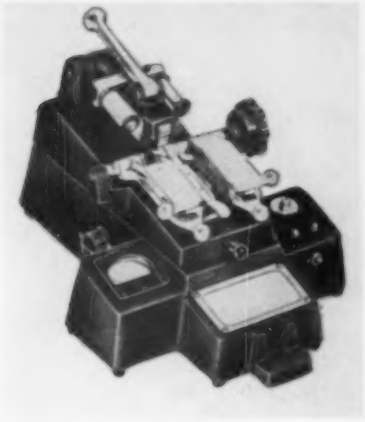
Company spokesmen added that the new unit can handle more than 40 jobs. Among these are invoicing, sales analysis, inventory control, production scheduling, cost analysis, and labor distribution. It is to be marketed with a tape reader for input, tape punch for output and typewriter for both input and output.

Circle No. 4-17

MBA Showcase

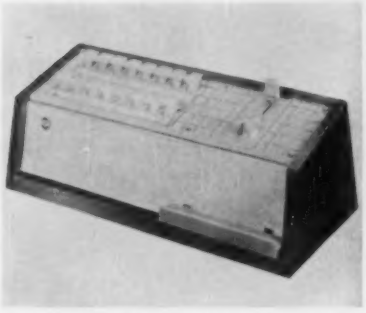
New Products for Business Automation

Magnetic Tape Splicer



A tape splicer that measures, cuts and seals magnetic and digital tapes in endless loops within precise length tolerances of plus or minus one thousandth of an inch is now offered by Prestoseal Mfg. Corp. The Presto-Splicer can butt-weld magnetic tapes end-to-end in 2¾ seconds, producing a splice said to be stronger than any other spot on the tape. The unit is simple to operate. Circle No. 4-19

RCA Transistor Intercom



A completely transistorized electronic intercom has been introduced by the Radio Corp. of America. The new equipment—RCA Instant Call—provides quick communication with two to 32 persons on a master system. Calls are announced by a light and chime. A busy light indicates a called station is on another intercom call. No interruptions are possible once a private call is in progress. Conference can be held if several station buttons are pushed or if an optional "all call" switch is used. A light remains lit on the called unit if the call is not answered. Circle No. 4-7

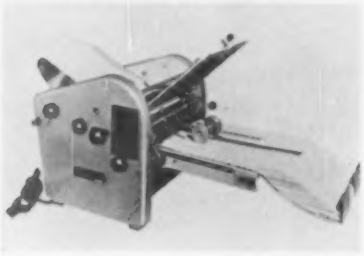
King-Size DP Ribbons

Latest designs in data processing ribbons used to visually record computer information are claimed by their manufacturer, the Kee Lox Mfg. Co. The silk or nylon ribbons are rugged enough to record continuously up to 1,000 lines per minute—providing extended legibility. Kee Lox also manufactures single, double and multiple colored ribbons, the latter two for applications where color coding is desirable or necessary. The ribbons are said to perform satisfactorily under the most severe conditions. Circle No. 4-1

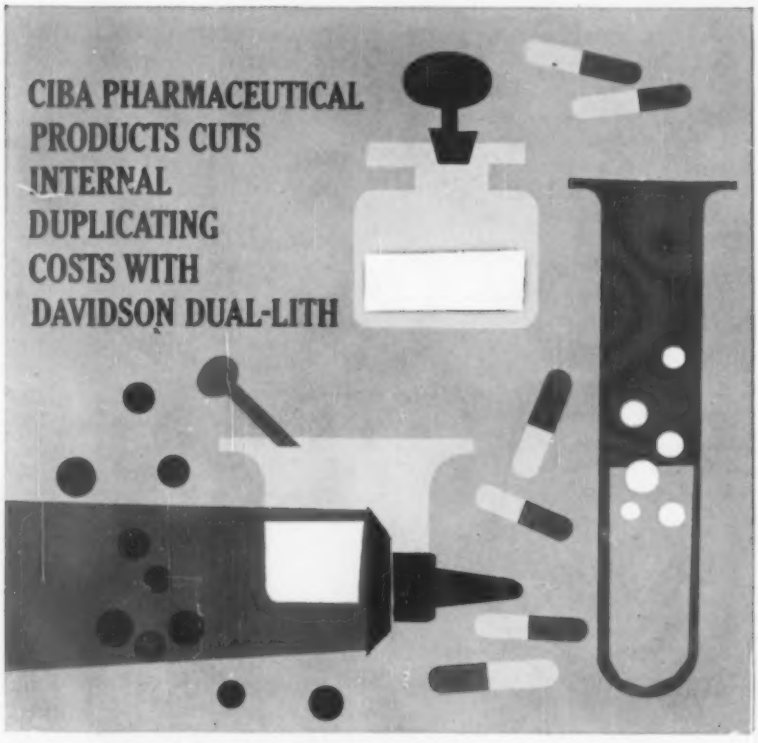
LN-3000 Small Process Digital Computer

Release of the LN-3000 digital computer for use in control of industrial process has been announced by Leeds & Northrup Co. According to the company, the fully transistorized machine, developed under a joint agreement with Philco Corp., is part of a system for process control and data processing in the electric power, metals, chemical, petro-chemical, and ceramics industries. Said to be one of the smallest process computers currently available, the machine and associated input-output equipment occupy about the same floor space as that required by a pair of four-drawer letter files. The machine can add or subtract in less than a thousandth of a second, the company said, and can multiply, divide or extract a square root in about three and one-half thousandth of a second. Sixteen such mathematical "orders" can be handled, all of which may be modified to provide more than 60 operations. Circle No. 4-15

New Folding Machines for Large Offices



Two Fold-O-Matic folding machines were designed for large offices, or as auxiliary equipment for printers, by Print-O-Matic Co. Inc. These table-top models are able to fold sheets from 4" x 4" up to 17¼" x 22" at speeds up to 9,000 per hour, in all types of parallel folds. The machines will split, perforate and score, or vertically crease with or without the folding operation. The All-Purpose (FH-6AP) and the Heavy-Duty (FH-5HD) models also feature many advantages such as a "snapout" axle for slitting, perforating or scoring. A patented feed cap eliminates the need for constant supervision. Circle No. 4-11



Headquartered at its 80-acre main plant in Summit, New Jersey, CIBA PHARMACEUTICAL PRODUCTS INC., produces a wide range of prescription and non-prescription drugs. Sales last year amounted to more than $37,000,000.

A constant flow of top-quality support literature is essential in this highly competitive industry, and CIBA relies heavily on its Davidson Dual-Lith Model 233 to produce brochures, marketing bulletins, sales manuals, research findings and other promotion material.

The Dual-Lith is used for all "professional-quality" work. It can turn out 100,000 impressions of a multi-color brochure to the same high standards with which it turns out 35 copies of the Board of Directors's report. And for workaday routine printing, the Dual-Lith 233's 14" by 17½" sheet size often allows several impressions of a job to be run on a single sheet. This means greater speed, efficiency and economy.

Despite the Dual-Lith's heavy workload, CIBA has experienced less than 1½ hours of machine down-time in over 18 months of operation.

The Davidson Dual-Lith Model 233 combines outstanding dependability, superb printing quality and unmatched economy. For the complete story on how it helps CIBA PHARMACEUTICAL PRODUCTS, call your Davidson Distributor (he's listed in the Yellow Pages) or send a letter to Davidson Corporation, 29 Ryerson St., Brooklyn 5, New York.

DAVIDSON CORPORATION
Subsidiary of Mergenthaler Linotype Company
29 Ryerson Street, Brooklyn 5, New York.

For More Information Circle Reader Service Card No. 4-68

Tough Recorder Tape

A recording tape designed to withstand the rough treatment of tape in business and industrial audio-visual uses has been announced by Minnesota Mining and Mfg. Co. "Scotch" brand No. 311 magnetic tape features a backing material called Tenzar, developed to hold up under recording and playback conditions involving frequent repeat, continuous play and constant handling, as in inventory taking or taped background music in an office. Two distinct colors, bluish brown on one edge and reddish brown on the other identify the track used. Circle No. 4-9

Printing Calculator

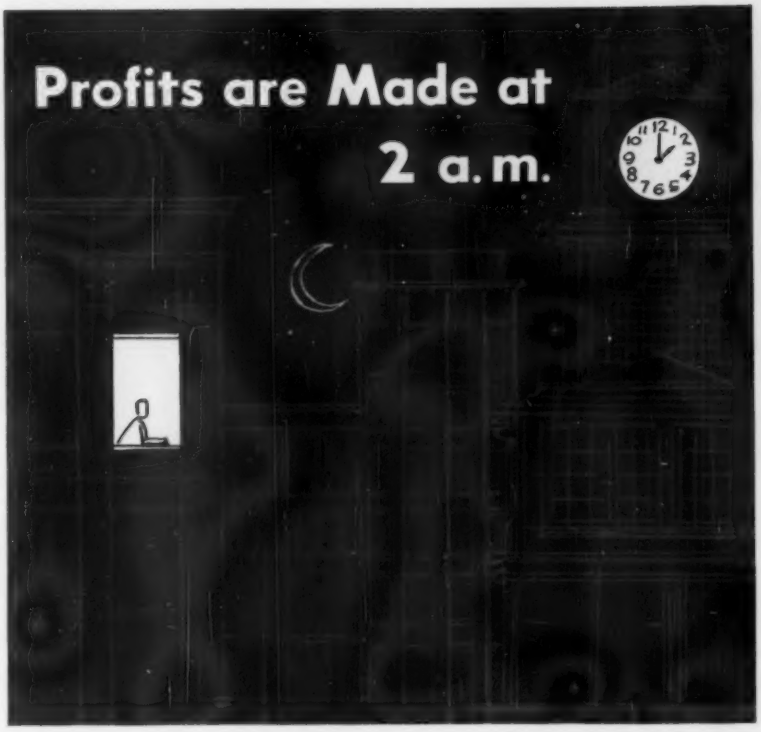
Addo-X Inc. announces an improvement on their printing calculator, model 3541E, now coming equipped with new "constant feature," a digit indicator and improved correction bar. The "constant" increases the machine's usefulness in specialized applications, such as invoice checking, calculation of discounts and percentages, calculation of areas, currency conversions, interest, duty and tax computations. Retailing at $595 list price, this calculating-adding machine still features negative multiplication, decimal point indicator and credit balance. Circle No. 4-3

All-purpose Recorder

The Executive TR-10 Transistor Tape Recorder and Dictating Machine is compactly constructed in a rigidized case. It weighs only 3½ pounds and fits into overcoat pocket or briefcase. It operates anywhere on penlite batteries, AC current or car battery. One knob controls all operations. A full hour can be recorded and played back on most standard tape recorders. Retails at $169.95, from Scopus, Inc. Circle No. 4-2

Dual Lens Camera

An electronically operated dual lens camera, called "Electra," that simultaneously photographs a person and a document on a single frame of film and may be activated by remote control, is available from the Regiscope Corp. of America. This device offers protection for supermarkets, department stores, retail stores, banks and industrial plants. The Electra may be leased for $17.50 a month or purchased for $495. Circle No. 4-8



The City sleeps, but this business goes on as usual, with the help of Baltimore Business Forms. Day and night customers phone their orders to central headquarters. Robot machines, in branch delivery offices, print orders simultaneously on troublefree Therm-O-Seal Handy-Fast Forms, recommended by the Baltimore Business Forms Systems Advisor. When morning comes . . . nighttime orders are completely written . . . ready for delivery without delay. The profits have been made . . . while the city sleeps.

Write or phone the Baltimore Business Forms Company for the interesting report . . . "A Robot Writes." Perhaps some of these money-making methods may be adapted to your own business.

Baltimore Business Forms

Division of the Baltimore Salesbook Company

3126 FREDERICK AVENUE, BALTIMORE 29, MARYLAND

For More Information Circle Reader Service Card No. 4-69

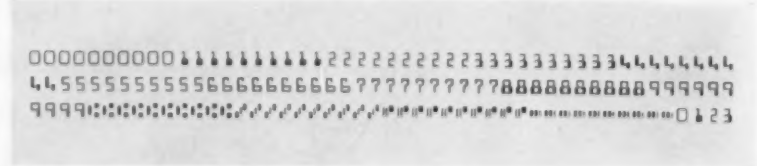
Remington Rand's Three Selective Interpreters

A new series of three selective interpreters, which speed and simplify a whole range of punch-card functions from preparation of customer bills and statements through printing of shipping labels, has been announced by Remington Rand Div. of Sperry Rand Corp. The new models are the Type 312-5 Selective Interpreter, the Type 312-6 Selective Posting Interpreter and the Type 312-7 Selective Posting Interpreter with Dual Card Receiver. Selective Interpreters can "select" data to be printed out with a high degree of flexibility. Among the new features of the machines is the ability to print on any one of 13 lines, as pre-selected on a control dial—above, between, and below all punching positions of the card. Other features include: dial selection of the line to be printed for each run of the deck; automatic selection of the card to be sensed; automatic suppression of printing on cards containing specified control holes; automatic suppression of sensing on all cards in a deck; posting up to 13 specified lines on a single card; and simplified operator setting and control dials on the front of the machine. A new style of type has been incorporated to facilitate improved reading of interpreted documents. The interpreters are applicable to commerce and industry; manufacturing, insurance, wholesaling, retailing, subscription fulfillment, public utilities, banks and in printing all types of bills. Circle No. 4-4

Print and Punch Teletypewriter

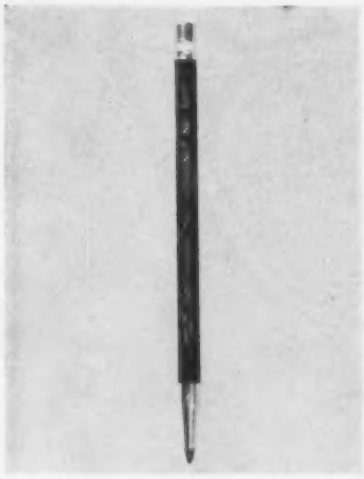
A teletypewriter, the Olivetti T2PN Printing Reperforator, will produce a printed message on a standard punched tape which is compatible with electronic readers and integrated data processing systems. Introduced by the distributor, the TEL-autograph Corp., the machine is used for both sending and receiving messages, prepares a conventional perforated, five-channel tape and at the same time it prints a typewritten message between the feed holes. These tapes are compatible with optical or electronic tape readers. The T2PN printing reperforator is also a self-contained teletypewriter, containing the unit with direct keyboard operation and compatible to existing teletypewriter circuits. Almost 20 different keyboard configurations are available, including four-bank configurations. The new unit is approximately the same size and weight as an electric typewriter. Two variations are available; an on-line receiver and an off-line unit tape preparer. The unit rents for $37 per month or sells for $1,900. Circle No. 4-13

Magnetic Ink Character Recognition Type Fonts



Complete fonts of E-13B for magnetic ink character recognition printing in bank check work are available through all authorized type dealers of the American Type Founders Co., Inc. The type has been officially approved for quality and accuracy by the Committee for Type Design of the Office Equipment Manufacturers Association. The type is guaranteed accurate regardless of when it was cast, as it is cast under controlled conditions and carefully inspected. The E-13B type comes on a 10 pt. body and its basic stroke weight is specified .010". There are 14 different characters in the design; 10 figures and 4 symbols. Circle No. 4-12

Reproduction Ball Pen



Writing or other marks made on documents or drawings that will be photocopied or reproduced will show up if written with this new reproducing ball pen by the Koh-I-Noor Pencil Co. Pens have black, red, blue or green inks for original writing. "Color Coded" reproducing refills are interchangeable. Circle No. 4-10

Automatic Time Recorder

A new series of automatic time recorders is now available from the Lathem Time Recorder Co. Time positioned in columns is automatically registered on a time card inserted in the machine, eliminating any chance of double registration. The 8800 Series has either a manual or an automatic two-column shift. Shorter time cards can be used, but the unit makes it possible to keep two weekly or semi-monthly payrolls on a single side of the card. An optional unit can sound a bell at intervals of predetermined length. Circle No. 4-6

Records **ROLL** to the seated clerk in Rol-Dex!

ROL-DEX record housing equipment saves time, money—

because records *ROLL* to the clerk (no waiting for hidden motor driven trays to come into place).

- Fewer personnel are required to handle large volumes of records.
- Floor space is saved.

find out about all the advantages of Rol-Dex equipment. It's built to fit your system, your form size, your volume, your space, your expansion plans.

Rol-Dex Division

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Jamestown, New York

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Rol-Dex Division, Dept. D-1, Jamestown, New York

☐ Please send literature.

☐ Have consultant call me for appointment ..... (phone)

Name ..... Title .....

Firm .....

Street .....

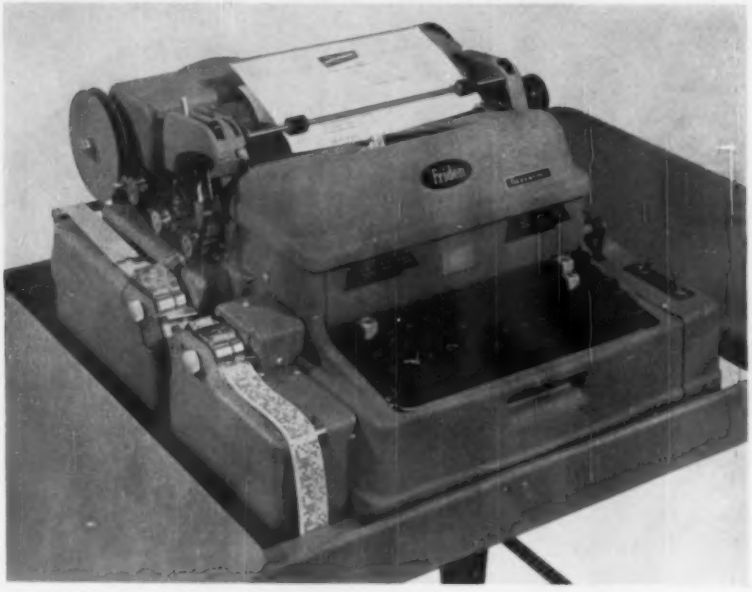
City ..... State .....

For More Information Circle Reader Service Card No. 4-70

Metal Index Tab

"Ambi-dex" is the name given to a reuseable, metal title tab which literally locks into paper-thin to pressboard-thick folders, covers, guides, sheetholders, drawings or other records considered important enough to file. Available in 10 different colors, the tabs play a major role in establishing a "color cue" filing system. The basic colors can be supplemented by an additional 15 colors for a complete alphabetical and numerical system. The metal tabs hold the title inserts in a "locked" position, which means they can not be removed unless the entire tab is removed. There are no hooks or frames in the assembly, and the tab can be used as a handle. The Ambi-dex Sales Co. has offered a 10-year guarantee on the life of the tab. Circle No. 4-16

Friden Introduces Executive Flexowriter

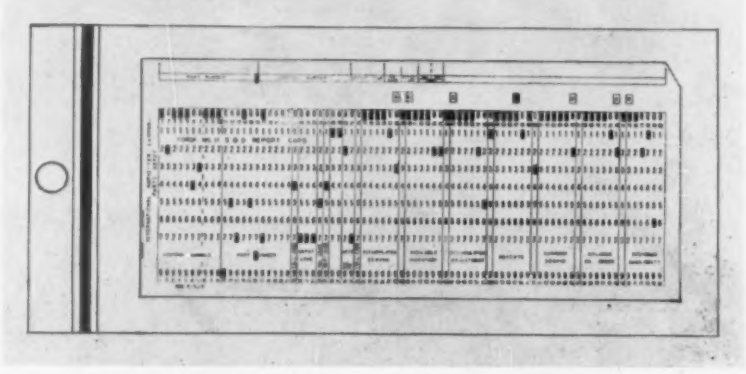


The Flexowriter President SFD, which offers the appearance of proportionately spaced type and the convenience of automatic writing, is now available from Friden, Inc. Designed for personalized executive correspondence, the new unit can also be utilized for the preparation of direct image masters, promotional releases, contracts, directories or proposals. Once the letter is set up on tape, codes can be included which stop the Flexowriter for the manual insertion of personal or other variable information. This information can also be added by means of a cable-connected auxiliary tape reader. The over-all appearance is an executive letter, even though it has been automatically typed at 100 words per minute. Circle No. 4-20

Data Collector

The Model 180 Data Collector, recently announced by Control Data Corp., collects and records on punched paper tape data applying to factory production scheduling, incentive payroll, inventory, quality and cost control and billing operations. The data gathered by this modular, self-contained unit is ready for computer processing. Variable information, such as job-lot number or amount produced, can be entered simply from 10 manually-operated dials. A card reading unit within the 180 can read identification data from pre-punched tabulating cards inserted on the spot. Fixed data, such as department number or plant location, is internally stored in the machine. Output data is recorded at the rate of 15 characters per second on 5, 6, 7 or 8 level punched paper tape, which can be processed automatically by any computer. Circle No. 4-5

Holder for Tab Cards and Forms



A holder for tab cards and forms, which provides record visibility and can be used indoors or outside, was introduced by Chicago Desk Pad Co. Called "Poly-Zip" Holders, they are made of transparent polyethylene and feature a patented closure, an airtight, weather-resistant seal fastened together by sliding the fingers over it. It is easily opened by inserting a finger at the top of the closure and giving a slight pull. It can be opened or closed repeatedly. Holders have a punched extension at the top for hanging and storage. A blue line in the center of the "Poly - Zip" closure identifies the product. The 4" x 9" size will hold cards or sheets up to 3½" x 7⅜", and list for 20¢ each. Circle No. 4-14

Copies On Request

The following booklets, catalogs and brochures are considered of interest to readers of MANAGEMENT and BUSINESS AUTOMATION. Copies can be obtained by using the Reader Service Card.

Stock Forms Catalog—This inventory book and catalog from UARCO, Inc., illustrates methods of fastening and rulings available on stock control punched forms; lists stock forms that can be shipped immediately; and describes binders suitable for storing burst and unburst forms. Circle No. 4-25

GE 210 EDP Computer System—A 12-page, color-illustrated brochure describes the "key to increased automation for large and small requirements." The GE 210 system can handle such operations as banking, utility billing and government requirements. Circle No. 4-26

Data Collecting System—A booklet introduces Friden's new Collectadata system of information gathering. It describes the equipment and suggests diagrams for application. Circle No. 4-27

Memory Bulletin—A four-page bulletin describes a series of general purpose high speed memories, from Telemeter Magnetics. Circle No. 4-28

Univac Tape Searchwriter—The Remington Rand Tape Searchwriter provides an integrated system which is described as an economical method of searching a magnetic tape file for a desired item. An eight-page booklet explains in detail. Circle No. 4-29

Microfilming of Engineering Data—An eight-page manual details how the Air Materiel Command, USAF, has converted engineering drawings and data to microfilm mount in aperture cards. Entitled "Standardization that Works," from The Filmsort Co. Circle No. 4-30

"Here's how I cut costs and saved hours in wiring CONTROL PANELS"

1. Wiring control panels for data processing machines used to be a headache—as was changing or checking those tangled wires. Then I read about the new GC panelLOGIC Kit. It was supposed to save me work, time and money, so I ordered one.

2. My panelLOGIC Kit came the same week, with pliers for cutting and stripping wires, two simple tools for wrapping and unwrapping, a supply of terminals, wire, and instructions. Clear step-by-step color photos show how to make neat, compact, tight panels.

3. Complete color-coding by major card field and machine function is simple with panelLOGIC's ten wire colors. Wiring is easy to check and to change. And finished control panels can be stored more compactly.

4. The beauty of panelLOGIC lies in its simplicity. Why didn't someone think of this before! Why don't you write and get the full story?

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This new full-color booklet shows the complete panelLOGIC Kit with its simple tools—explains how to use it. For your FREE copy, send this coupon today!

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For More Information Circle Reader Service Card No. 4-72

NEWS

Shell Oil First Computer-By-The-Hour Customer

The first "do-it-yourself" data processing customer at the IBM Datacenter in New York City is Shell Oil Co. The Shell staff, pictured above from left to right, Miss Barbara Jean Feigl, programmer; Ramon L. Burke, supervisor of operations; Ernest F. Koenig (seated at console), assistant manager of data processing, and Charles M. Jones, manager of data processing, have taken over the Datacenter's IBM 709 to calculate the economy of petroleum distillation methods. At the rate of 42,000 calculations a second the basic results come off the 709 in six minutes, 800 times faster than by manual computational techniques. Hourly rates are $450 until 6 p.m. and $315 thereafter. Shell Oil is also using the Datacenter facilities to ready programs and operators for next year when it will be delivered a solid-state IBM 7090 data processing system.

Punched Card Expert Held in $250,000 Swindle

A 50-year old specialist in punched card accounting procedures has been arrested in New York on charges of embezzlement. Accused is Frank B. Haderer, former vice president and accounting manager for Walston & Co., one of the nation's largest brokerage houses.

According to V. C. Walston, company president, Haderer has stolen a quarter of a million dollars over an eight year period by creating fictitious punched card entries in the company's electronic bookkeeping system. Haderer, Mr. Walston explained, would punch cards to cover withdrawals from the firm's vast interest account, and then create other cards to indicate an offsetting deposit to one of the two accounts maintained by he and his wife at the brokerage house. The juggling was accomplished at hours when other employes were not present, such as Sunday mornings.

The embezzlement, which escaped annual audits, was finally discovered by a special audit of the firm's employes' trading accounts.

Haderer, one of Walston's 24 vice presidents, joined the company in 1949 when he installed the machine accounting installation. He was made manager of the accounting operation in 1957. According to company officials he was "reputed to be one of the outstanding brokerage experts in the use of IBM equipment." Haderer has admitted the thefts, the District Attorney's office said.

NOMA International Meets in Montreal

The 41st International Conference and International Office Exposition of the National Office Management Association scheduled for Montreal, Canada, May 22-26, will have as its theme "New Dimensions for Office Executives."

Keynoting the sessions will be H. H. Lank, president of DuPont of Canada, Ltd., on Monday, May 23, at 9:00 a.m. The Annual Meeting and election of International Officers and Directors will follow the keynote address.

On Monday afternoon at 1:00 p.m., M. E. Mengel, vice president of Burroughs Corp., Detroit, will appear in a panel discussion "Your Office—Of The 60's" with a talk entitled "Forecasting Developments in Office Equipment," rounding out a realistic look into the decade of the '60's.

M. E. Mengel

At the huge Montreal Show Mart, the latest developments and innovations in office equipment, supplies and machines will be exhibited by many North American companies. The latest techniques and methods of modern office equipment use will be explained by the exhibitors.

Name Change Rejected By NMAA

Directors of the National Machine Accountants Association meeting at Ft. Worth, Tex., have rejected a proposal to change the association's name. Proponents of the new name — Data Processing Management Association—lacked the necessary two-thirds vote to adopt the name, though a majority of the directors voted (71 to 46) in its favor.

NMAA president, D. P. Paquin of Chicago, informed the directors that exploratory talks regarding possible merger had been held with the Association of Computing Machinery.

The nominating committee, headed by James Fee of Dallas, announced the recommendations for national officers at the annual election which will be held at the NMAA June Conference in San Francisco. They are: president, L. W. Montgomery, Shreveport, La.; executive vice president, Wilfred C. Andrews, Jr., San Francisco; treasurer, Clyde DuVall, Chicago. Nomination for vice presidents at large: Robert S. Gilmore, Torrence, Calif.; Elmer Judge, Wichita, Kan.; Henry G. McIntosh, Detroit; E. Phillip Daro, Carlstadt, N. J.; Carroll D. Parry, Columbus, Ohio; Al Ziegler, Aurora, Ill.; and John L. Brandt, Philadelphia.

Shoholm Heads New Computer Services Firm

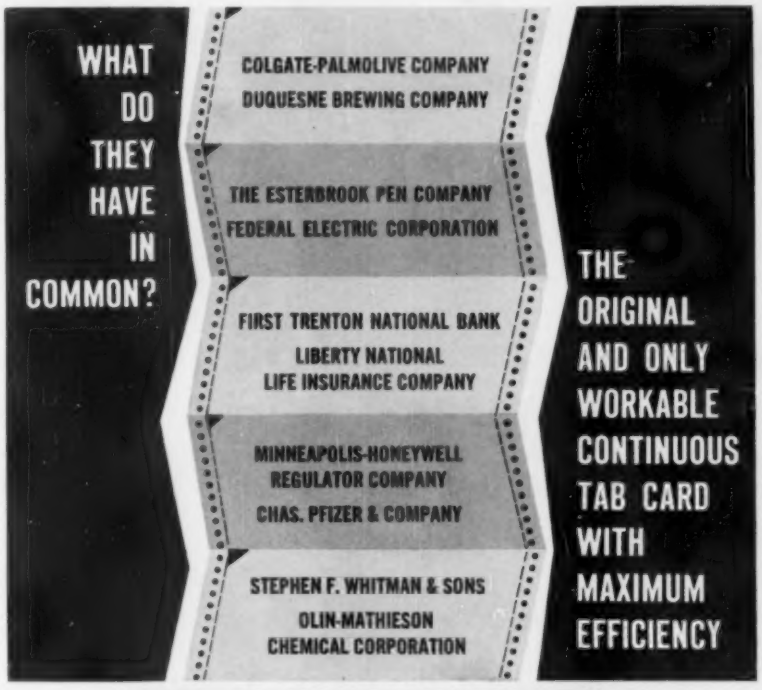
Formation of a new firm, Electronic Computer Services, offering computer programming training, personnel selection consultation, computer application engineering, contract programming and system analysis services, has been announced by the company's president, Gordon D. Shoholm, of Chicago. Mr. Shoholm was formerly application and field liasion representative to the banking industry for General Electric's Computer Dept.

According to Shoholm a key feature of the new firm's services is the "Package Computer Service Plan." Under this plan ECS representatives meet with a prospective computer user, investigate areas in which the equipment will operate, discuss possible future applications and evaluate maximum requirements.

Specific physical equipment requirements are developed and the price, capability and performance of competitive computer systems evaluated.

The plan also includes a two-phased personnel development program. The first phase consists of six weeks of basic computer programming familiarization. This phase is preceded by a group of exacting aptitude tests supervised by Deborah L. Blumer, consulting psychologist (See MANAGEMENT AND BUSINESS AUTOMATION, Dec. 1959). The second phase involves a 20-week detailed familiarization with all major computer systems and includes individual attention to the system selected by the programmer's company.

Future plans for Electronic Computer Service call for training in logic design, scientific applications, magnetic character reading, and what Shoholm calls, an executive seminar program, which includes development of men to take over all phases of electronic data processing management.


WHAT DO THEY HAVE IN COMMON?
COLGATE-PALMOLIVE COMPANY
DUQUESNE BREWING COMPANY
THE ESTERBROOK PEN COMPANY
FEDERAL ELECTRIC CORPORATION
FIRST TRENTON NATIONAL BANK
LIBERTY NATIONAL LIFE INSURANCE COMPANY
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STEPHEN F. WHITMAN & SONS
OLIN-MATHIESON CHEMICAL CORPORATION
THE ORIGINAL AND ONLY WORKABLE CONTINUOUS TAB CARD WITH MAXIMUM EFFICIENCY

FORMSCARD

Two years ago, we introduced FORMSCARDS, the only continuous tab card with no medial waste strips between cards. Since that time, the companies listed above and hundreds of others among the best known business and industrial firms in the world have become enthusiastic FORMSCARDS users. Here's why:

no medial waste strips between cards
pre-punched as required
tabulate at any speed
separate manually or on any burster
vouchers of any length; side, top or bottom
can be part of a multiple forms set

call, wire or write:

Forms inc

manufacturers of line-hole continuous business forms

WILLOW GROVE, PA. • PHONE: OLdfield 9-4000
Sales representatives in principal cities

For More Information Circle Reader Service Card No. 4-73

BRUNING MAN teams up
Copyflex copying machines
with Teletype printers . . .

Clifford Jelinske, (right) of Bruning's Milwaukee Branch, and Philip Beckley, of The Trane Company, review results of unique solution to paperwork bottleneck. The Trane Company is a leading manufacturer of heating, ventilating, and air conditioning equipment.

gives **The TRANE Company**
same day shipment
of orders!

Stock orders received at The Trane Company before 2:00 p.m. are shipped the same day, invoices completed the next day. All despite a two mile distance between order department and the shipping department.

Order-billing department edits orders then transmits data on inexpensive translucent order forms to the distant stocking-shipping department via Teletype printer. On the receiving printer, a 5-copy factory order set is produced simultaneously.

Shipping notices from the order set are sent back to order-billing department where quantities shipped, extensions, etc. are entered on original translucent transmittal order forms. From the completed order forms, Copyflex reproduces all necessary invoice copies. No clerical transcription of repetitive data.

There you have it: same day shipment, next day invoicing, clerical rewriting and retyping eliminated at a big saving of time and money.

BRUNING *Copyflex* Diazo Copying at Its Best!

The Bruning Man in your area can help you slash paperwork, speed major company operations. He's backed by a company with over 60 years' experience. He's located in principal U.S. Cities. In Canada: 103 Church Street, Toronto 1, Ontario. Home office: Mount Prospect, Illinois.

For More Information Circle Reader Service Card No. 4-74

Chrysler Corp. Tests Kineplex System

Using Kineplex, punched card information is transmitted over telephone lines at rate of 100 cards per minute.

The Chrysler Corp. has completed a successful demonstration of a Kineplex high-speed digital data communications system, involving transmission of over 500,000 punched cards. The card transmission circuit, product of Collins Radio Company's Western Division, linked the automaker's general offices in Highland Park, Mich., with the main Dodge plant in Hamtramck, Mich. Cards were sent over a telephone line at the rate of 100 per minute.

During the nine day demonstration the Kineplex system operated in full duplex mode, with cards transmitted and received in both directions simultaneously. Binary-punched computer program cards as well as accounting and parts inventory control cards were transmitted for the auto company observers.

Chrysler officials said the Collins data communication system was being evaluated in line with their increasing computer and data processing requirements and the need for accurate, high-speed transmission of data between their various plants and offices.

A similar demonstration was conducted by Collins recently for the Veterans Administration during which 350,000 cards representing actual insurance premium notices were transmitted between St. Paul, Minn., and Philadelphia, Pa., over telephone lines.

WJCC Meets in May In San Francisco

The Western Joint Computer Conference meets at the Jack Tar Hotel in San Francisco on May 3-5. It will have as its theme "Computers — Challenge of the Next Decade."

General chairman of the conference, Robert M. Bennett, Jr., of IBM Research Laboratories, San Jose,

R. M. Bennett, Jr.

anticipates record-breaking attendance.

An informative and valuable program has been developed around new computer technology.

Joint sponsors of the 1960 WJCC are the Institute of Radio Engineers, the American Institute of Electrical Engineers and the Association for Computing Machinery.

NCR To Install Network Of DP Centers

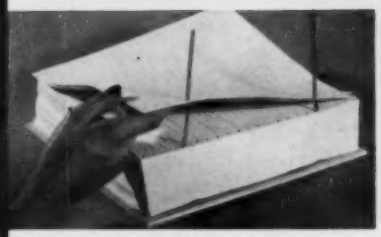
Plans have been announced by National Cash Register Co. for a nationwide network of data-processing centers that will make record-keeping automation available to virtually every type and size of business. The plan will enable retail stores, industrial and commercial firms, savings banks and other companies to obtain a detailed analysis of their previous day's business in less than 24 hours.

Stanley C. Allyn, NCR board chairman, said NCR will open three centers this year; one in New York, in the new Getty Building, another in Los Angeles and a third in Dayton, the company's headquarters.

For Bursted or Unbursted Data Processing Forms

Disposable Storage Binder

NBB Cable-Post Jr. Binder — a gray pressboard binder that costs so little you can throw it away with the records when they become obsolete.

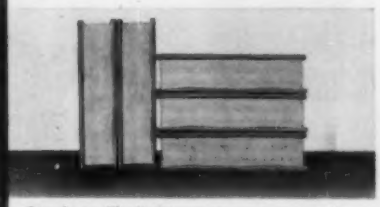


New Type Cable Post — steel cable encased in nylon, flexible but will not crack with use.

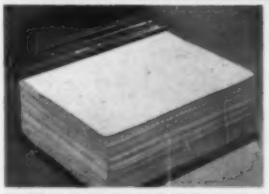
Easy to Load — posts "thread" easily through marginal punchings. Can load from top . . . unload from bottom.

Easy to Lock — clips fasten to binding strip.

Flat Opening — permits reference into margin.



Stack or Shelf Storage — no protruding posts — mechanism concealed when cover is closed.



NBB Cable-Post Binder for Current Records. The No. 1 choice for an efficient, long-lived binder for data processing forms—posts of steel cable encased in nylon, vinyl plastic cover, slide locking mechanism. Can load from top . . . unload from bottom — *ideal for revolving records!*

NATIONAL BLANK BOOK COMPANY

Dept. 1104, HOLYOKE, MASSACHUSETTS

Please send more information about NBB Binders for Data Processing Forms.

Name_____

Company_____

Street_____

City_____ Zone_____ State_____

The name of my office supply dealer is:

_____

For More Information Circle Reader Service Card No. 4-75

MBA Reviews

Automatic Teaching: The State Of The Art

Eugene Galanter, editor. Published by John Wiley & Sons, Inc. N. Y. $3.25.

A significant effort to record and evaluate the methods associated with the field of machine teaching describes many techniques and critically reviews them according to their expected role in American education.

The book is based on a collection of 16 papers presented at the conference on the Art and Science of the Automatic Teaching of Verbal and Symbolic Skills, sponsored by the Air Force Office of Scientific Research and the University of Pennsylvania, in December, 1958. Aspects of machine teaching covered include: programming, analysis, machine design, experimental results and criticism.

One paper describing "intrinsic programming," explains it as the name given to the sequencing of information, questions and answers used in an especially designed textbook for computer teaching. This is of particular interest in the light of devices now available.

Do They Understand You?

By Wesley Wiksell. Published by The Macmillan Co., N. Y. $4.95.

A guide to effective oral communication is of utmost importance to executives who must be understood by their associates, employes and even their friends. Mr. Wiksell points out that oral communication depends on one's own attitude and its effect on the listener, one's understanding and an ability to listen.

He shows the benefits to be gained from effective communication are better understanding, better cooperation, higher morale, and ultimately, greater profits. This guide is well-organized, effectively illustrated, thorough, practical and easy to use.

Computers And How They Work

By James D. Fahnestock. Published by Ziff-Davis Publishing Co. N. Y. $4.95.

A comprehensive, easy to understand book on computers describes in clear, precise terms the basic principles behind computers, their manufacture and how they are operated and maintained at a high level of efficiency. No knowledge of electronics is necessary.

The book provides a solid foundation for the study of computer techniques and explores all the intricacies of computers in language free from highly technical terminology. Examples and illustrations explain all the fundamental aspects of computer language, arithmetic, programming, and circuitry; the means of communication between men and machines; and the ways in which a computer "remembers." Highly recommended for layman and technical people alike.

New from EBERHARD FABER

A COMPLETE LINE OF REPRODUCING AND NON-REPRODUCING PENCILS AND BALL PENS

Designed Especially for Office Copying Machines! Each Eberhard Faber marking instrument has undergone extensive research and testing to insure the ultimate in marking perfection. With one or more of the 68 popular makes of copying machines.

FREE handy reference chart!

Mail coupon today for Eberhard Faber chart indicating best writing instrument for each of the various copying machine processes.

SINCE 1849 EBERHARD FABER puts its Quality in writing

Wilkes-Barre, Pennsylvania-New York-Toronto, Canada

NOBLOT Fotorite
Available in four colors with inks specially compounded for photocopy machines. Gold polish, wood-cased, plastic front cone, top, point protector.

Blak-Print
For use with most office photographic reproducing machines. Available with hard or soft lead.

Blak-Print
A new reproducing ball pen with special black ink for use with Diazo, Photocopy, Verifax, Thermofax and Xerography processes. Black with brilliant aluminum stamping.

FOTORITE
A reproducing pencil for use with infra-red processes.

Contak
A hi-conductivity pencil designed for marking tabulating cards and test scoring sheets used in electronic tabulating and test scoring equipment.

Litho-Print
Designed for use with offset printing processes.

NOPRINT
Writing on originals will NOT reproduce, depending on color of lead.

EBERHARD FABER PEN & PENCIL CO., INC.
Dept. BA, Crestwood, Wilkes-Barre, Pa.
Send me Reproducing Pen and Pencil Selector Chart.
NAME_____
TITLE_____
COMPANY_____
ADDRESS_____
CITY_____ ZONE____ STATE_____

For More Information Circle Reader Service Card No. 4-66

MBA's Calendar

April 8-9—Third annual Regional Data Processing Conference, NMAA, Syracuse, N. Y. Contact Robert Bell, Drug Trading Co., Ltd., 15 Ontario St., Toronto, Ontario, Canada.

April 18-19—Third Annual Conference on Automatic Techniques, Cleveland-Sheraton Hotel, Cleveland, Ohio. Jointly sponsored by the ASME, AIEE and IRE. Write J. H. McRainey, Room 530, 1213 W. 3rd St., Cleveland 13, Ohio.

April 22-23—Greater Cincinnati NMAA chapter sponsoring Southeastern district regional conference, Hotel Netherland Hilton, Cincinnati. Write chapter at P.O. Box 863, Cincinnati 1, Ohio, for information.

May 3-5—The 1960 Western Joint Computer Conference, Jack Tar Hotel, San Francisco.

May 15-18—Insurance Accounting and Statistical Association Annual Conference and Business Show. Sherman Hotel, Chicago.

May 18-20—Operations Research Society of America, Seventeenth National Meeting. Statler-Hilton Hotel, New York City. Contact ORSA, Mt. Royal & Guilford Aves., Baltimore 2, Md.

May 22-27—41st International Conference and Annual Exposition of the National Office Management Association. Queen Elizabeth Hotel, Show Mart, Montreal, Canada.

May 23-24—Federal Government Accountants Exposition and Meeting, Statler Hotel, New York City.

May 26—Five Southern California Chapters (SPA) sponsor the second annual Western Systems Conference at the Statler-Hilton Hotel, Los Angeles. For further information write, George Ryan, 6986 Bandini Blvd., Los Angeles 22, Calif.

June 22-24—National Conference and Business Show of the National Machine Accountants Association, San Francisco, Calif. Mark Hopkins and Fairmont hotels and California Masonic Memorial Temple for exhibits. For information, write P.O. Box 3617, Rincon Annex, San Francisco 19.

August 23-25—Annual Meeting-National Conference of the Association for Computing Machinery, Marquette University, Milwaukee, Wisc.

August 23-26—Western Electronic Show & Convention, sponsored by the Western Electronic Manufacturers Association and the Los Angeles-San Francisco Seventh Region of the IRE. Sports Arena, Los Angeles.

October 10-12—International Systems Meeting (SPA). Hotel Commodore, New York City. Write International Headquarters, Systems & Procedures Association, 4463 Penobscot Bldg., Detroit 26, Mich.

Classified Advertising

SALES MANAGER AVAILABLE

Sales Manager and/or sales executive, young (41), extensive background in machine and systems sales, sales management, sales training. Write MANAGEMENT AND BUSINESS AUTOMATION, Dept. A-1, 100 East 42nd St. New York 17, N. Y.

Rates for classified advertising are 75 cents a word with a minimum of $10.00 per insertion. Payment should accompany order. Allow 6 words if blind box number is used. Deadline: 10th of month preceding date of issue.

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EDITORIAL

Audit In Depth

A unique "do-it-yourself" investment program came to light last month with the discovery that a brokerage house vice president—a specialist in punched-card accounting—had key punched his way into the company till to the tune of a quarter of a million dollars (See News, page 54).

Many will think it incredible that a company could have such poor control and audit procedures as to allow a systematic swindle to go undetected for eight years. Yet, before any executive adopts the attitude that "it can't happen here," we suggest that he take a closer look at his own machine accounting operation. Not that we think that a thorough investigation of individual installations will turn up any embezzlers. But, we'll wager that the investigation will uncover many practices that, in the long run, can be as costly to the company as an active program of embezzlement.

For example, we've long been amazed at the number of large installations that operate without benefit of the basic principles of good machine accounting management—mainly, written procedures, job schedules and machine utilization records. These items make a major contribution to operating efficiency; and when any of them are lacking, the company is being robbed just as surely as if someone was regularly dipping into the cashbox.

"Reruns" provide an excellent illustration of this point. The machine time, labor and forms involved in the rerunning of reports add thousands of dollars daily to the cost of punched card systems. These reruns are invariably the result of poorly prepared or outdated procedures. How strange it is that some managements will insist on costly and detailed manuals of procedure for every function of the company—except the machine accounting department.

We recommend that top management schedule a periodic "audit in depth" of its punched card operations. We're sure that the machine accounting manager whose house is in order will welcome such an audit. Where the installation is in trouble, the audit will spotlight the cause.

"Our work load is expected to more than double in the next twelve years, and a long-range program of automation seemed to us the only way to accommodate this anticipated volume with maximum accuracy, promptness and economy. Our choice of the RCA 501 was based on these considerations."
—Howard C. Petersen, President
FIDELITY
PHILADELPHIA TRUST COMPANY

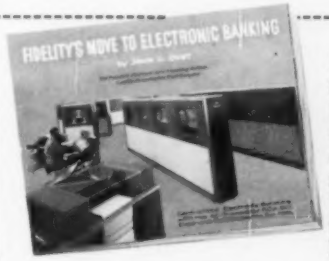
HOW A LEADING PHILADELPHIA BANK PLANS FOR PROGRESS

A daily average of 90,000 checks are drawn on Fidelity-Philadelphia Trust Company and presented to it for payment. To handle this huge paperwork flow, now and in the future, Fidelity will install an RCA 501 as the first step of a multi-phase conversion to automated data processing.

The RCA 501 requires only a minimum investment, yet is large enough to handle the major problem of demand deposit accounting. Among other advantages, the RCA 501 will maintain continuous up-to-date records, will prepare and print statements, and provide trial balances which will be ready at the start of each business day for all accounts of Fidelity's twenty-five offices.

In later phases of conversion—when personal credit, savings accounts, general accounting, etc. will be progressively assigned—the flexibility of the RCA 501 will be of tremendous advantage. The size of the system will simply be increased by adding units in building-block fashion *as they are needed.*

For full information on how the RCA 501 can benefit your business, address RADIO CORPORATION OF AMERICA, Electronic Data Processing Division, Camden 2, New Jersey.



For a detailed story of Fidelity's program to automate its operations, ask for report entitled, "Fidelity's Move to Electronic Banking".

RCA 501 ELECTRONIC DATA PROCESSING SYSTEM

RCA Tmk(s) ®

RADIO CORPORATION of AMERICA

ELECTRONIC DATA PROCESSING DIVISION, CAMDEN 2, N.J.

Cadillac Gage gets tight production and labor control...reduces clerical costs by 30% with easy-to-use Automatic Keysort

NEED: fast, accurate management reports for controlling production of ultra-precision units—and a 226-man work force.

COMPANY: Cadillac Gage, leading manufacturer of electric-hydraulic servo valve assemblies for missiles and aircraft.

SOLUTION: the easy-to-use, low-cost machines and punched cards of Automatic Keysort Data Processing.

METHOD: Keysort punched cards, mechanically code-notched with required information for rapid sorting, are created as original documents for 1) material planning, 2) job-routing and 3) labor distribution. Upon completion of each job, the accounting department automatically processes the collected information with the Keysort Tabulating Punch—internally coding the cards with actual and estimated time of job. This unique machine then automatically produces a tabulation of variance in work time by work center and order number.

RESULT: with the comprehensive, on-time reports made possible by Automatic Keysort, Cadillac Gage is now able to pinpoint any job in the plant . . . can determine the cost of labor and the total time spent on each job by department and individual clock number. Knowing where they stand, management can act *at once* to correct a profit-losing situation. Best of all, it's done without specialized personnel. Without restrictive procedures. And at remarkably low cost.

For a detailed report on Automatic Keysort Data Processing at Cadillac Gage, call your nearby Royal McBee Data Processing Representative, or write Royal McBee Corporation, Data Processing Division, Port Chester, New York for Case History 977.

ROYAL McBEE · *data processing division*

NEW CONCEPTS IN PRACTICAL OFFICE AUTOMATION

For More Information Circle Reader Service Card No. 4-78